MAY 20, 1996 VOLUME 13, NUMBER 21

NetworkWorld

THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

SPECIAL SECTION

DISTRIBUTED NETWORK MANAGEMENT

Planning your attack. Page 14.

Feisty Fore takes a shot at desktop ATM

By Jodi Cohen
Warrendale, Pa.

Just when it seemed ATM was in danger of dying at the desktop, Fore Systems, Inc. is attempting a rescue.

The Asynchronous Transfer Mode LAN giant this week will put its weight behind the fledgling ATM25 technology when the company announces its first 25M bit/sec switches and network interface cards.

The move comes on the heels of the recent ATM Year 96 conference in San Jose, Calif., where attendees said ATM is losing to switched Ethernet and Fast Ethernet as the preferred desktop technology (*NW,* May 13, page 1).

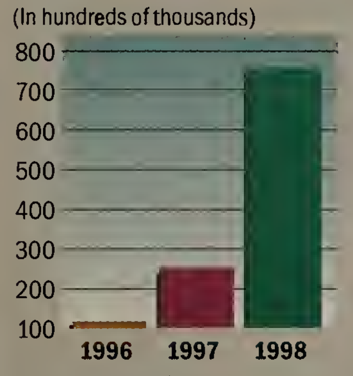
But Fore's ATM25 gear will allow customers to take advantage of ATM's quality-of-service, multimedia capabilities and scalability, which are features Ethernet cannot yet match.

"Both 10M and 100M bit/sec Ethernet are getting a lot of

See **Fore,** *page 80*

ATM25 OUTLOOK

The number of ATM25 desktops (adapter cards and switch ports) being sold is on the rise.



SOURCE: CIMI, VOORHEES, N.J.

Trio gangs up on Cisco

By Michael Cooney

IBM, 3Com Corp. and Bay Networks, Inc. this week will join forces to offset Cisco Systems, Inc.'s growing power in the routing and switching markets.

The vendors, united as the Network Interoperability Alliance, said their strategic mission is to help customers blend Fast Ethernet, Asynchronous Transfer Mode and other equipment from various vendors into enterprise networks.

By year-end, for example, they promise to integrate their virtual LAN technologies. They also plan to develop and implement standards, as well as set up interoperability test beds.

Tactically, the alliance is seen as a way for the vendors to combat Cisco, which has emerged as the internetworking market's

See **Trio,** *page 78*

Delve deeper Into switching on Network World Fusion. Find:
- **A primer on PNNI**
- **A Cisco white paper on VLAN interoperability**
- **An article on past troubles in interoperability standards**

NetworkWorld Fusion

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Access Network World Fusion using the number in yellow. See page 5 for details.

'Net devices coming...

By Carol Sliwa and Ellen Messmer

The much-hyped Internet appliance market moved one step closer to reality today as industry leaders unveiled a set of common guidelines for the development of these devices.

Oracle Corp. Chairman Larry Ellison, the instigator of the diskless, stripped-down Network Computer, will be joined on the podium by executives from IBM, Sun Microsystems, Inc., Netscape Communications Corp. and a host of other companies.

They will throw their support behind a Network Computer

See **Devices,** *page 77*

...but what are they good for?

By Ellen Messmer and Carol Sliwa

If they build the Network Computer, will the corporate MIS department come to buy?

The answer from users and analysts is yes, no and maybe so.

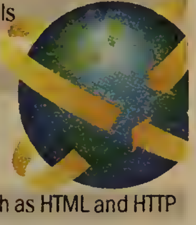
Although users are interested in the Network Computer concept popularized by Oracle Corp., they seem fairly evenly divided on its chances for success.

See **Net Computer,** *page 77*

WHAT ALL THE FUSS IS ABOUT

The Network Computer reference profile offers vendors these guidelines:

- Minimum screen resolution of 640 by 480 pixels
- A pointing device
- Audio output
- IP-based protocols such as TCP, FTP and NFS
- Web standards such as HTML and HTTP
- E-mail protocols such as SMTP, IMAP4 and POP3



Unauthorized confab takes Java to task

By Ellen Messmer
New York

Software engineers view Java as C++ done right. But that's not to say Sun Microsystems, Inc.'s Internet-enabled programming language doesn't have its problems.

At the International Java Developers Conference — which was not endorsed by Sun — attendees said Java applets hold promise but are slow, hog memory, raise security questions and are not as portable as Sun would lead you to believe. Tools to build and exploit Java applets are also lacking.

"Java libraries are insufficient and immature," said object programming guru Grady Booch, chief scientist with Rational Corp. and the conference's keynote speaker. "Java performance is an issue. There are risks. I don't think I can automate my entire organization with Java."

A recent Princeton University

See **Java,** *page 78*

Benchmark or bust

Users recount troubles tying network benchmarking efforts to business gains and offer up some practical advice.

By Charles Bruno

Despite their best efforts to prove the effectiveness of their network services in furthering corporate objectives, a group of net managers recently came to this revelation: For the most part, they have a long way to go.

"One of our challenges is showing. . .that the investment [in IS] is something the company can't live without to improve the bottom line," says Paul Brown, director of network operations for Baltimore-based Helix Health Systems, Inc. "The problem is, how do we ask the right questions to get the answers we need?"

Brown's quandary is one that network IS groups are hard-pressed to resolve. To help them out, *Network World* recently hosted a roundtable discussion on network benchmarking, inviting executives from Helix Health, Amoco Corp., Panhandle Eastern Pipe

Dave Beering *(right) explains the importance of the research community to Amoco's benchmarking efforts.*

See **Benchmark,** *page 60*

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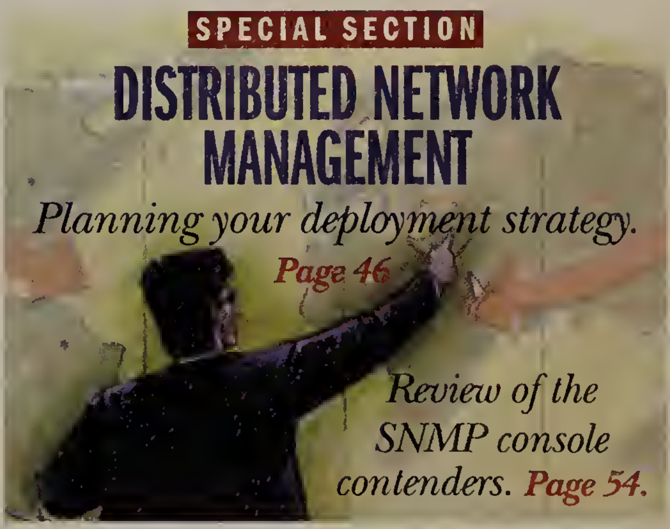
SPECIAL SECTION

DISTRIBUTED NETWORK MANAGEMENT



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NetworkWorld's *Mission: To provide news and analysis that help network IS professionals deliver the network computing infrastructure and distributed applications required to meet evolving business needs.*

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This Week

News+

tFlash.

- Turn to News+ for daily breaking news of the networking industry. NetFlash is updated Monday through Friday around 1:30 p.m. EST.

The Front Page

- Java: Read the latest on security holes and other potential problems with Java.
- Desktop ATM: Download primers and proposals for bringing ATM to the workstation at 25M bit/sec.
- Network computers: While Oracle is busy rounding up supporters for its planned Network Computer, other vendors, such as Apple, are developing alternatives. Sneak a peek at their plans.

The Technical Sections

- Apple: Bite into our Apple resources, which include articles and links related to the company's plans for the Internet, and download Apple's Cyberdog software developers' kit, in Local Networks.
- Area codes: Download lists of new area codes, read about the disastrous impact of a new area code in Alabama and see what the FCC has to say in WAN's &Internetworking

NetRef

- Network security: Get background information on The Open Group's X/Open Security specifications, in Client/Server Applications.
- Need help taming the network management beast? Pick up a primer on network management, then download our reviews of four management consoles and our report on distributed management.

this week's pick

Get objective. The Los Alamos National Laboratory maintains a page about the Common Object Request Broker Architecture at http://www.acl.lanl.gov/CORBA. You'll find everything from primers and tutorials to vendor lists and detailed papers on modeling distributed-object applications.

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NetworkWorld Fusion

CONFERENCE PICK

HOT TOPIC

Read Kobielus on the new telecom world, then add your two cents' worth.

Select Forum, Columnists, Above the Cloud.

News briefs, May 20, 1996

International equality

■ UUNET Technologies, Inc. today plans to announce a global roaming service for mobile users of its AlterDial Internet access service in the U.S. Beginning May 31, users will be able to dial a local number in nine other countries and access the UUNET backbone just as they would in the U.S., with charges integrated into their regular bill. UUNET plans to bring up another eight countries at the end of June.

MCI, BellSouth hook up

■ MCI Communications Corp. last week signed its first agreement with a regional Bell operating company that provides local interconnection in multiple states. MCI reached a two-year agreement with BellSouth Corp. that sets terms for connecting the carriers' local telephone facilities in Alabama, Florida, Georgia, North Carolina and Tennessee. The agreement covers such issues as physical interconnection, reciprocal compensation, interim number portability, 911 services and directory listings.

BBN to play host

■ BBN Planet and USWeb Corp. last week signed an agreement under which BBN will provide Web hosting services to USWeb customers beginning June 1. USWeb is a new World-Wide Web outsourcing firm that provides content, design, database hookup and other services to companies that want to create a Web presence. The company, headed by former Novell, Inc. technology chief Sheldon Laube, recently signed up its first three affiliates in Albuquerque, N.M., Atlanta and Tampa Bay, Fla.

McAfee puts up virus shield

■ McAfee last week announced WebShield, software for network firewalls and Internet gateways that scans all incoming and outgoing traffic for viruses. McAfee said firewall vendors Border Network Technologies, Inc. and Secure Computing, Inc. plan to resell WebShield as a stand-alone product or integrated with their firewall products. WebShield will also work with CheckPoint Software Technologies, Inc.'s FireWall-1 product. WebShield runs on Intel and Alpha processor-based systems. WebShield ships Aug. 15, and a two-year license costs $3,995.

On your guard

■ NetGuard, a Carrollton, Texas subsidiary of LanOptics, Ltd. last week introduced its Guardian firewall system, a product that addresses security concerns over linking private IP nets with the Internet. The offering consists of firewall agents that run on Windows NT and OS/2 Warp PCs, as well as a management program for controlling the agents. The price for a gateway and management system starts at $3,980.

Shakeup at Bay

■ Bay Networks, Inc. last week announced a reorganization that divides product development and marketing among three business units. The new structure includes the Enterprise Business Unit, headed by Dick Eyestone, senior vice president of product and market management, and Michael Grady, senior vice president of engineering; the Internet/Telecom Business Unit, headed by Bruce Sachs, executive vice president, and the Xylogics Business Unit, also directed by Sachs. All executives report to Andy Ludwick, Bay's president and chief executive officer.

Network World intranet seminars coming soon

■ Wondering what an intranet is? Get all the answers you need at a new *Network World* seminar series called Intranets: Technologies, Tools & Strategies.

The one-day seminars begin May 30 in Atlanta and visit 13 other cities, winding up in Cincinnati on Aug. 8. Mark Gibbs, an industry consultant and *Network World* columnist, will conduct the seminars. Topics will include how to build an intranet. The seminar costs $395. For advanced reservations, call (800) 643-4668.

Nortel, Micom partner in voice/data marriage

By David Rohde
Toronto

Northern Telecom, Inc. last week grabbed a fellow traveler in the field of voice/data convergence and offered to share the ride.

The big telecommunications equipment maker signed a definitive agreement to purchase Micom Communications Corp. of Simi Valley, Calif., for approximately $150 million. Micom manufactures subrate multiplexers capable of dishing out a combination of voice and data traffic over 9.6K bit/sec and fractional T-1 leased lines.

In the last year and a half, Micom has added IP and IPX routing and voice-over-frame relay capabilities to its core products. Analysts said they were intrigued by the deal, noting similarities behind Nortel's voice-over-Asynchronous Transfer Mode capability on its Magellan Passport enterprise switch and the ability for voice traffic to piggyback on leased data circuits or frame relay connections in Micom's Marathon and NetRunner integrated multiplexers.

Both vendors' product families purport to save users money by enabling them to avoid long-distance toll charges on the public switched telephone network. "This is a fascinating proposed acquisition," said Steven Taylor, president of Distributed Networking Associates, Inc., a consultancy in Greensboro, N.C.

According to a 1995 International Data Corp. report, Micom had more than double the marketshare of any other sub-T-1 multiplexer vendor. But Taylor said that while Nortel will gain Micom's substantial installed base among small and midsize companies, the two vendors' markets actually will not immediately mesh.

"As the Micom people themselves put it, they have specialized in the Unfortunate 500,000," Taylor said.

The growing interest in alternatives to traditional circuit-switched telephony helped push the two companies together.

Both Magellan Passport — which dynamically interleaves voice packets with datastreams rather than using constant-bit-rate ATM — and Micom Marathon products use triggers such as silence detection to achieve acceptable voice compression of 8-to-1 and higher, Taylor said.

"Low-bit-rate voice has gotten quite good," he added. "Most people will tell you it's now near toll quality." The only proper place to use it today is within private corporate networks, Taylor said, but that's a key aim of the Magellan marketing effort.

The two companies initially got together to develop an access platform that was to be marketed by both companies, according to a Micom executive who spoke on the condition of anonymity. He would not detail the product but said the companies might release details toward the end of next month, after the purchase is complete.

Senior Writer Tim Greene contributed to this story.

NORTEL AND MICOM UNITE

Company:	Micom Communications Corp.	Northern Telecom, Inc.
Based:	Simi Valley, Calif.	Toronto
Financials:	Fiscal 1996 revenue of $84 million	Fiscal 1995 revenue of $10.7 billion
Primary products:	Sub-T-1 multiplexers and frame relay access devices with voice capabilities	Multiprotocol and ATM enterprise network switches, CO switches and PBXs

HP, Netscape join in 'Net venture

By Carol Sliwa
Palo Alto, Calif.

Hewlett-Packard Co. and Netscape Communications Corp. last week announced a business alliance they said will address growing demands in the corporate intranet and Internet access markets.

The partnership — which unites a company more noted for its hardware with a software vendor whose name has become almost synonymous with the Internet — will encompass a wide range of areas, including technology and product development, marketing, sales, support, consulting and training.

"The whole thing is a positive for both companies," said David Card, an analyst with International Data Corp. Netscape, still small and not "really prepared to be a full-service" company, gains the benefit of HP's noted service and support staffs, he said, and from a technology standpoint, it gains access to HP's management expertise.

As for Hewlett-Packard? "Most companies don't think HP when they think Internet," Card said.

The alliance between HP and Netscape calls for collaboration on several projects:

- An open framework architecture for workforce collaboration, and identifying and publishing extended APIs.
- Intranet management solutions for both Unix- and NT-based environments using Netscape's line of server products and HP's OpenView management software.
- Interoperable corporate messaging between HP OpenMail and Netscape's Mail Server.
- Printing-oriented extensions to HTML, and a customized version of Netscape's Web browser for HP's Laserjet printer. ■

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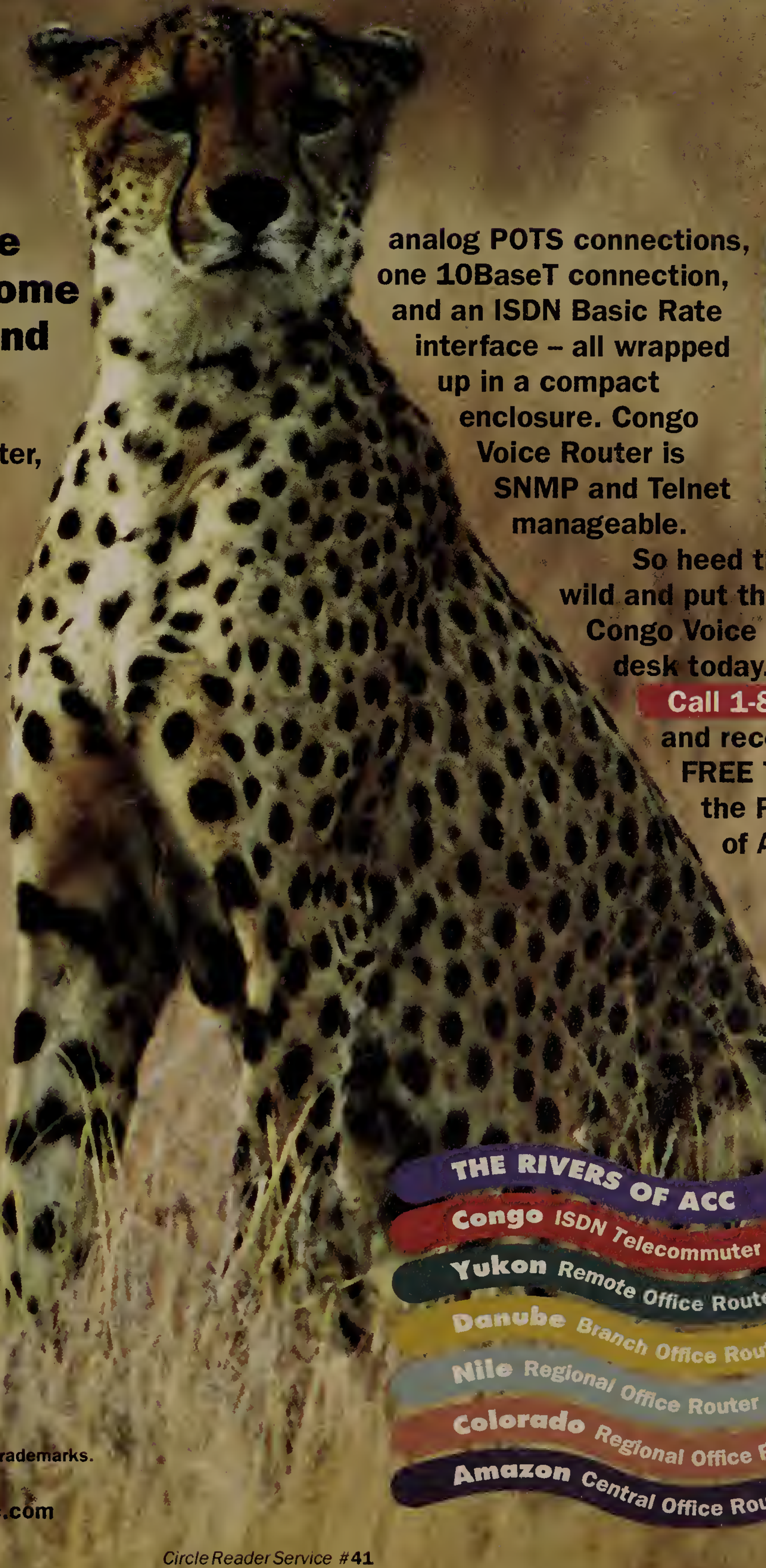

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Circle Reader Service #41

Phone numbers are running out

By Tim Greene

In some regions, phone numbers may become a precious commodity, running out before users can prepare for new area codes.

A national association of carriers is trying to figure a way to slow down the number drain, but some carriers fear that an answer will not come soon enough.

"My greatest fear is some morning, I get a call for a new phone number and I don't have one to give," said Dennis McClure, director of carrier relations at Teleport Communications Group (TCG).

McClure said that could happen sometime next year if something is not done before then. "From our point of view, if we don't have a phone number to sell, we don't have a business," he said.

There are plenty of new area codes to back up the existing ones — 640 new ones were approved last year. But the fear is that they will be exhausted before users and carriers adequately prepare for a switchover.

Predicting exactly when an area code will be exhausted has proven difficult. The 1995 industry list of area codes that would run out over the subsequent 10 years included 46 area codes; the 1996 list has 88. Three area codes — 310 in California, and 214 and 713 in Texas — weren't even on the list last year but are now projected to run dry by the end of this year.

That indicates that users anywhere could be faced with the expense and aggravation of reprinting business stationery and somehow notifying their customers of a new area code. In places where new area codes have been instituted, the experience has been a nightmare (*NW*, Sept. 18, 1995, page 24; Sept. 25, 1995, page 35).

In California, where 13 area codes are expected to fill up during the next 10 years, the Public Utilities Commission (PUC) has approved a method that would slow the rate at which area codes fill up.

Under California's old rules, phone numbers were distributed in blocks identified by the three numbers following the area code. Those three numbers were known as the NXX code. All the numbers in an NXX code were typically reserved for a single carrier and corresponded to a single billing center, which was a geographic area used for determining toll charges.

The result? In some areas with a small number of phone lines in use, thousands of phone numbers could sit idle indefinitely, simply because there was no demand.

The California PUC now allows carriers to split NXX blocks between more than one billing center, putting more of them in use and extending the length of time an area code will last.

McClure said he expects a situation where TCG actually runs out of phone numbers as early as next year.

TCG, which supported the California plan, wants it to be adopted nationwide quickly. Its proposal and others are being considered by the Industry Carrier Capability Forum.

TCG wants to avoid individual states coming up with different solutions, which would make the system more complex than it needs to be, McClure said.

Demand for phone numbers continues to mount as home users install second phones and businesses grow. As local phone markets open to competition, demand grows even more quickly for two reasons.

First, the blocks of numbers each carrier reserves are nontransferable. So if a carrier does not use all the numbers in a block, they sit idle.

Second, under local competition rules, users have to be allowed to keep their old phone numbers when they switch to a different carrier. While it appears that the number follows the user to the new company, the underlying method is actually a form of call forwarding. Calls to the old number are forwarded to a second number held by the new carrier. That second number is invisible to the user but is nonetheless used up.

Call forwarding is a temporary answer for letting users take their phone numbers with them. The industry is working on a permanent solution that does not eat up an extra number. ■

Go to Network World Fusion (http://www.nwfusion.com) for:

- An article on the havoc wreaked in Alabama when it got a new area code
- A copy of the latest North American Numbering Plan
- An FCC fact sheet on new area codes

Select News+ then WANs & Internetworking

NetworkWorld Fusion

AT&T caps usage charges on key PRI offering

By David Rohde

Bedminster, N.J.

AT&T is cutting a break to large users seeking to harness a key capability of ISDN Primary Rate Interface connections.

The carrier is quietly waiving high-volume usage charges on its Temporary Signaling Connections (TSC) service, an AT&T official confirmed. TSC enables as many as 16 users at one site to simultaneously transfer data associated with their ongoing telephone calls, as well as the calls themselves, in real time to a distant site.

AT&T, in effect, is capping usage fees by waiving the tariffed rate of $8 per thousand monthly transactions at high-volume levels, said AT&T ISDN product manager Ken Zachary (see graphic).

That adds to the potential cost savings of ISDN PRI itself, which can substitute for the expensive private lines commonly needed to synchronize voice and datastreams across WANs.

For example, in a network of inbound 800 call centers using TSC instead of private lines, one agent can transfer a call to an agent in another location and simultaneously send customer data the caller already entered into a voice response system.

Or a network of private branch exchange or automatic call distributor (ACD) switches can determine the routing of the call and place customer data from an enterprise database on a distant agent's screen.

No need to fear big volume

Monthly charges for each Temporary Signaling Connections arrangement per location:

First 25,000 user connections: $300

Each additional 1,000 user connections: Waived (ordinarily $8)

$500 installation fee per arrangement remains in effect.

SOURCE: AT&T, BEDMINSTER, N.J.

Potential TSC use within call centers recently got a boost when switch vendor Aspect Telecommunications, Inc. announced TSC support in Release 6 of its Aspect CallCenter ACD system.

To establish TSC connections, Aspect users must also install the vendor's Network InterQueue system, which enables a single incoming call to be queued on as many as 52 Aspect CallCenter switches and 192 agent groups.

"AT&T is the only carrier that provides PRI Temporary Signaling Connections," said Michael Broyles, Aspect marketing manager. "It enables our networked users to eliminate point-to-point T-1 charges and reduce hardware costs with fewer trunk cards."

Until next month's shipment of Aspect's Release 6 software, TSC is only available to users with the Definity G3 PBX system with ACD capabilities.

AT&T's Zachary cautioned users to carefully calculate their own potential costs of using TSC. If a network administrator wanted to give the capability to 32 simultaneous users at each of three dispersed 800 call centers, that would count as six TSC arrangements. Each of the six would generate its own monthly charge, up to the promotional cap.

For its own part, Aspect charges $15,000 to add TSC capability to existing Network InterQueue systems and $35,000 for new Network InterQueue installations. ■

AT&T, Unisource expand venture

By Joanie Wexler

London

AT&T has been busy getting its international house in order.

On the heels of being named a nondominant carrier in the international telecommunications arena, AT&T last week said it is expanding its venture with Unisource in Europe.

The carrier said its Uniworld joint venture with the Unisource consortium of four European carriers will become a bigger company under a new name, AT&T-Unisource Services. The $1 billion, pan-European entity will add multimedia, Internet, outsourcing, consulting, systems integration, wireless and other services to the planned Uniworld voice and data portfolio.

AT&T is also forming another company with Unisource — AT&T-Unisource Investment — for forging European partnerships and making investments as the European telecommunications market becomes fully deregulated in 1998.

Despite this activity, AT&T has little to show for its international partnering. Launched more than a year ago, the Uniworld effort has yet to yield any jointly delivered services, despite the announcement last summer of a Uniworld virtual network service that was to become available in October 1995. The reason is a tightening of regulations in Europe after rival MCI Communications Corp. formed its $1 billion Concert joint venture with British Telecommunications plc in 1994. Through the Concert venture, which has BT holding a 20% stake in MCI, the companies are jointly offering virtual network, frame relay, packet and managed bandwidth services to 2,500 customers in 800 locations.

"Concert has stolen the thunder in the international arena," said Jeffrey Kagan, an industry analyst at Kagan Telecom Associates in Atlanta. "They're out there doing deals while AT&T is still setting up shop."

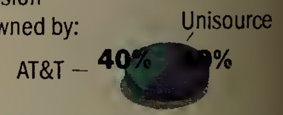
AT&T and Unisource can individually offer the virtual network service under the Uniworld label. But the merging of operations and joint delivery of services with unified billing, common network management and other features is on hold until the European Commission officially approves the venture.

The Federal Communications Commission earlier this month determined that AT&T is nondominant internationally (*NW*, May 13, page 11), which should speed that approval. ■

How they've expanded

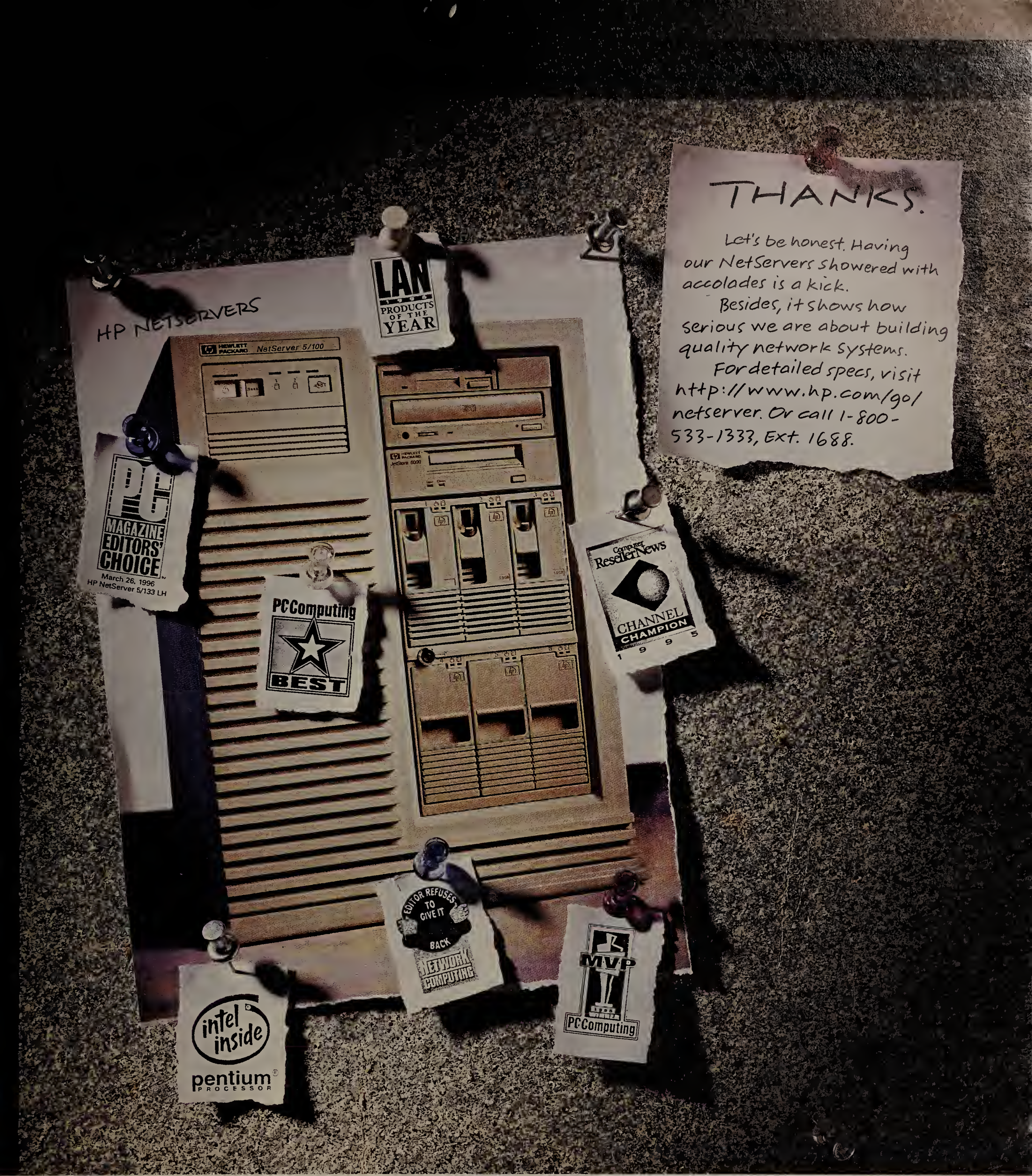
AT&T-Unisource Services joint venture...

- adds Multimedia & Solutions Division to Uniworld, now called Communications Services Division
- is owned by:



AT&T-Unisource Investments joint venture...

- is equally owned by AT&T and Unisource
- gives Unisource option to take minority equity stake in AT&T U.K.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HEWLETT® PACKARD

New Marshal cleans up Windows NT security

By Kevin Fogarty
Houston

Mission Critical Software, Inc. is taking aim at one of the greatest security weaknesses in Windows NT Server: the uncontrolled power of the NT administrator.

The tiny Texas company last week shipped a product that limits the power of NT administrators, something Microsoft Corp. will not do until the Cairo version of NT ships in late 1997 or 1998.

Enterprise Administrator creates subclasses of administrators, called Deputies, who are given rights by a high-level administrator called a Marshal.

The Enterprise Administrator server includes an intelligent agent that becomes the only entity on the net actually designated as an NT administrator.

While it looks to the Marshals and Deputies as if they are making administrative changes using NT Server's User Manager, they are actually using the Enterprise Administrator client to ask the Enterprise Administrator server to make a change on the NT network's Primary Domain Controller.

Without Enterprise Administrator, even low-level administrators have full access to everything within a multiserver NT domain. When that domain includes all the NT Servers in an organization — a design Microsoft recommends to reduce administrative complexity — every administrator has godlike powers over the entire network, analysts said.

"In order to give somebody in Los Angeles the ability to change a password for someone in Los Angeles, you have to give them the right to delete all the files in an organization," said Louis Woodhill, president of Mission Critical Software.

Marshals can limit the time or geographic area in which a Deputy can make changes; they can group the network into Territories defined by geographic or organizational boundaries.

"The ability to delegate administrative authority into workgroups is something people have been spoiled with in NetWare," said Neil MacDonald, an analyst at the Gartner Group, Inc.

"When they go to NT, a lot of them are disappointed in the granularity of the security," he said.

Woodhill said the product would be priced on a per-user basis, but the company will not announce specific pricing until this week.

Microsoft will add more granular security to NT in Cairo, but it will rely on third parties such as Mission Critical for added security in the interim, said Rob Lilleness, product manager for Windows NT Server at Microsoft.

Mission Critical is not the only independent software vendor to have noticed the hole in NT's security, however.

FastLane Technologies, Inc.'s recently released Final 5 for NT Server, an NT management scripting language, which lets users write routines to automate administrative tasks, as well as to create and administer relationships between multiple NT domains.

©FastLane: (800) 947-6752; Mission Critical: (713) 960-8818.

Wireless LANs get a shot in the arm

By Joanie Wexler

Impatient to get wireless LANs out of the warehouse and into more customer sites, Proxim, Inc. plans to announce today that it is opening up its technology as a potential standard.

The company, which makes one of the most broadly installed wireless LANs, RangeLAN2, said it will begin licensing specifications for the 1.6M bit/sec network to other vendors this summer.

If the same technology appears in multiple vendors' equipment, customers will be able to mix and match access points and client hardware from different suppliers. Manufacturing volumes should go up and drive prices down, analysts said.

Currently, 20 vendors make products that incorporate the RangeLAN2 radio, which Proxim sells as a component. Fifteen vendors have committed to building their own products based on the specification, which will be available this summer.

Among the devotees are AMP, Inc., Data General Corp. LXE Corp., Norand Corp. and Zenith Data Systems. These vendors have teamed with Proxim in an effort they are calling the Wireless LAN Interoperability Forum. The Forum will develop testing certification procedures and ensure their systems run together. Products are expected late this year.

Still no cigar

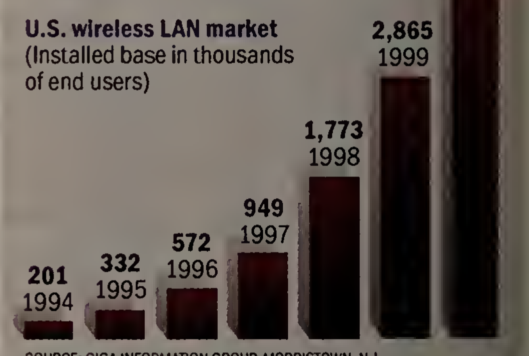
The move comes five years after the IEEE 802.11 standards group began working on a wireless LAN standard. The group, however, has yet to publish a specification. The goal is to specify a radio frequency interface between an access point, sometimes called a bridge or base station, and the client device.

Proxim approached the 802.11 committee two years ago about adopting RangeLAN2 as a basis for the IEEE standard, but the committee turned the company down, believing it could build something better. Meanwhile, RangeLAN2 has become a de facto standard.

"The whole wireless LAN industry has suffered because there has been no standard," said Craig Mathias, a principal at Farpoint Group, a consulting firm in Ashland, Mass. This has resulted in vertical applications and islands of deployment, he said. ■

Taking its time

A lack of standards and unclear user benefits have so far kept the wireless LAN market from exploding.



SOURCE: GIGA INFORMATION GROUP, MORRISTOWN, N.J.

Cabletron's

intranet

seminar

Intranets are a hot topic right now. Everyone has an opinion on why you need one, who should use it–even what it can do for your company. There's plenty of information about the end result, but the "experts" tend to gloss over the nuts and bolts details of how to build one.

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Circle Reader Service #32

Cabletron, CA take mgmt. to new enterprise heights

By Jim Duffy

Network and systems management is about to take the next technological leap, if last week's developments from Cabletron Systems, Inc. and Computer Associates International, Inc. (CA) are any indication.

Cabletron is developing a data warehouse for its Spectrum management system that will allow users to deploy any of the leading relational databases as a central repository for accounting, billing, and historical trend and event information. The warehouse, which eventually will be object based, will emerge in the third quarter.

CA, meanwhile, said it is at least six months ahead of schedule in shipping what may be the most elegant network and systems management platform in the industry. CA-Unicenter/TNG features a virtual reality user interface, an object data repository and sophisticated application management capabilities.

The maneuvers indicate current network and system management offerings have almost reached their technical limits, and that more elaborate measures are required if vendors want to offer true end-to-end capabilities.

Cabletron kicked off its data warehousing initiative by announcing it has implemented Object Design, Inc.'s ObjectStore database in its SecureFast Virtual Networking Services (VNS) software. Cabletron's SecureFast VNS enables users to build and manage switched virtual internetworks.

ObjectStore is a high-performance object database that allows SecureFast VNS to log more than 250 calls per second for virtual connection setup. This is 10 times faster than what standard relational database technology can handle, Cabletron said.

ObjectStore will also serve as a data feed to the Spectrum warehouse. This will allow Spectrum users to monitor virtual network call setup and address resolution as part of an overall enterprise network and system management routine.

"If they can achieve what they're claiming, then it certainly sounds attractive," said Ron Hudson, assistant director of network services at Johns Hopkins University in Baltimore. "One of the concerns we've always had is, as you scale up the number of calls going through a SecureFast server, is the server going to be able to keep up with that load."

Cabletron did not disclose a time frame for the object-based data warehouse.

However, CA said it will ship its object repository by the end of this year as a component of CA-Unicenter/TNG.

"Unicenter's going to become a true framework, not just a suite of applications," according to Paul Mason, director of enterprise systems management research at International Data Corp. in Framingham, Mass.

In the framework space, CA will compete most aggressively with IBM and its Tivoli Systems, Inc. subsidiary. ■

NETWORK MANAGEMENT LINEUP

Here's what Cabletron and CA have in store.

Cabletron

- ▶ Using Object Design's ObjectStore database as a high-performance repository for SecureFast Virtual Networking Services data
- ▶ Developing a data warehouse for the Spectrum management system using industry-leading databases
- ▶ ObjectStore will be one of many sources of data for the Spectrum data warehouse

Computer Associates

- ▶ General availability of CA-Unicenter/TNG will be six months ahead of initial early 1997 shipping schedule

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*Circle Reader Service #***38**

Remote access gear piles up

By Jim Duffy

Remote access was anything but a remote possibility last week as three leading vendors expanded their arsenals for doing battle in this hot market.

Ascend Communications, Inc. extended its MAX line of remote access concentrators for central corporate sites and Internet service providers (ISP).

In addition, Cisco Systems, Inc. rolled out two ISDN access devices for small office/home office users, and Gandalf Technologies, Inc. unveiled central-site concentration and SOHO equipment.

The move to link telecommuters, mobile users and branch offices to corporate sites and the 'Net is driving demand for more remote access gear. Indeed, remote access routers accounted for $1.4 billion of the $4 billion in router shipments for 1995, according to Dataquest, Inc. of San Jose, Calif.

Ascend's new platforms are the high-end MAX 4002 and 4004, and the midsize MAX 2000.

The MAX 4004 supports four T-1/Primary Rate Interface ports with built-in channel service units, an Ethernet port, a V.35 synchronous serial port, a management port and six expansion slots for modem cards. The MAX 4002 has two fewer T-1 ports, but can be upgraded in the field to the 4004. Fully configured, the MAX 4000 series can support up to 96 simultaneous sessions over a combination of analog, leased-line, frame relay, ISDN and Switched 56 services.

The MAX 2000 comes with one T-1/PRI WAN connection, an Ethernet port and a synchronous serial port for connecting to a frame relay network. Two expansion slots are available for digital modems or videoconferencing support.

Pricing for the MAX 2000 starts at $6,500, while pricing for the 4002 and 4004 starts at $11,000 and $15,500, respectively.

Separately, Cisco rolled out the successor to its 750 line of ISDN routers for giving SOHO users and telecommuters access to corporate nets or the Internet. The 765 and 766 devices each support a single Ethernet, an ISDN Basic Rate Interface and two analog ports for allowing telephones, fax machines and modems to share the dual-channel ISDN BRI.

"It will drop a data channel, allow a fax to come through and then the data channel comes back up," said John Bowling, president of Arlington, Texas-based Mobile Data, Inc., a user of the new Cisco gear.

The devices route IP and IPX traffic, and support supplemental telephone services such as call waiting, call hold and call retrieve. The 765 sports an ISDN S/T interface for connecting to external termination equipment, whereas the 766 features an integral Network Termination-1 interface. Pricing for both products, which are available now, starts at $1,299.

Not to be outdone, Gandalf has answers for both Ascend and Cisco. For central sites and ISPs, Gandalf unveiled the XpressStack Internet Access Server (IAS), and for SOHO users, Gandalf unwrapped the XpressConnect 5230i and 5231i.

The high-end device supports 48 simultaneous connections through two T-1/ISDN PRIs. It reduces administrative costs through support of dynamic IP addressing, and supports PPP, the Multilink Protocol, the Bandwidth Allocation Control Protocol, and the Point-to-Point Tunneling Protocol.

Pricing for the XpressStack IAS was not disclosed. It will ship in July.

The XpressConnect 5230i boasts a single ISDN BRI and two analog ports for delivering voice, fax and LAN traffic to the home. It supports IPX spoofing for efficient communication with NetWare servers and costs $589.

The XpressConnect 5231i supports dynamic IP addressing for Internet access and two analog voice ports. It costs $689.

Both products will ship in the fourth quarter.

©Ascend: (800) 621-9578; Cisco: (408) 526-4000; Gandalf: (613) 274-6500.

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What's more, BorderWare doesn't require expensive workstations. In fact, it operates on an Intel 486 or Pentium® processor.

As well, it has everything you need to link to the Internet: Mail, News, WWW, FTP and DNS. And it combines packet filtering with both application-level and circuit-level gateways.

BorderWare also enables you to define proxies for secure and specialized applications through the firewall. It responds to attacks and initiates alarms. And is configured to grow as you and your enterprise do.

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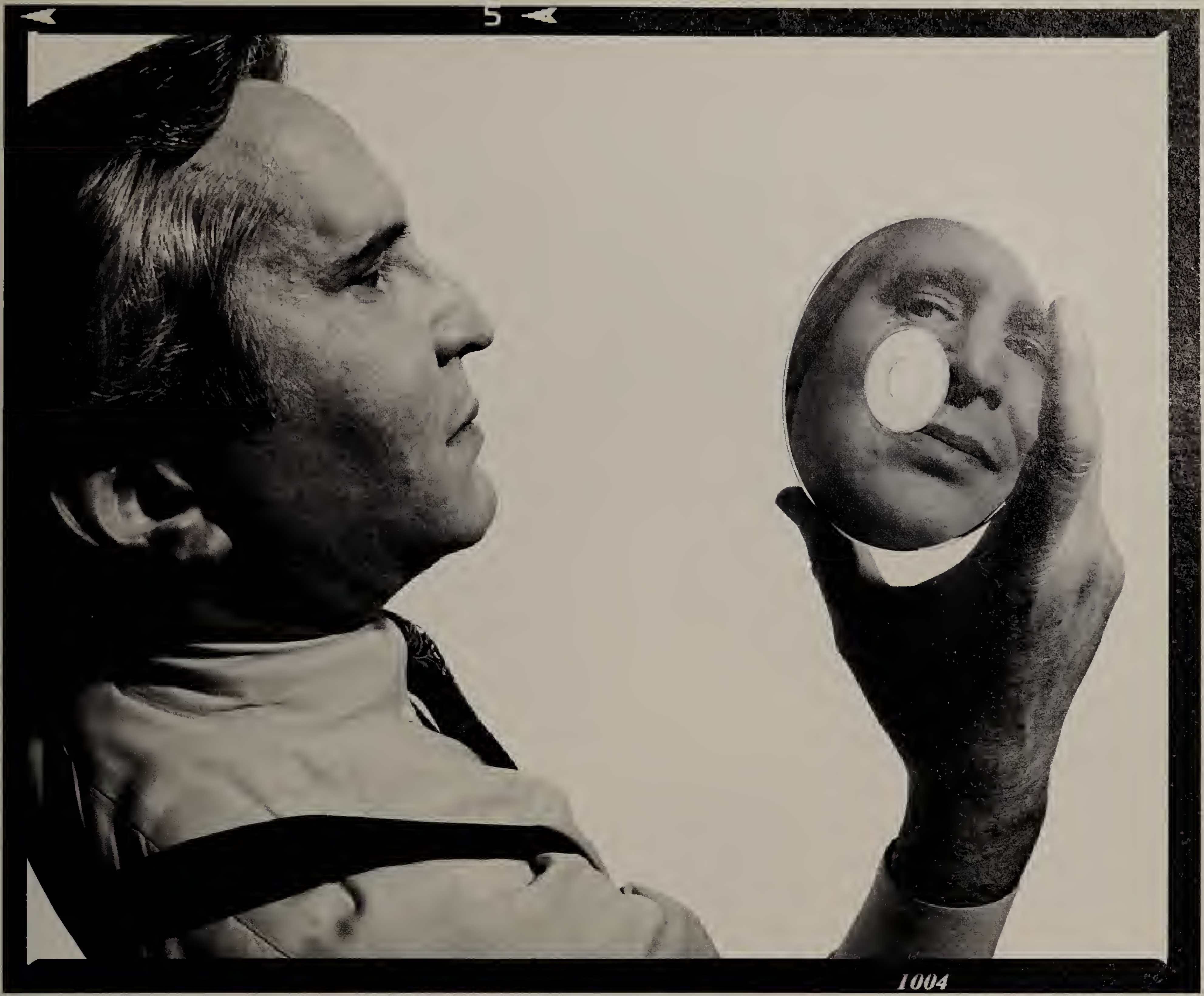

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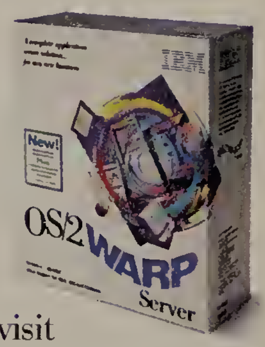

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Will the Internet bring an end to business computing as we know it?

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For example, it's never been easier to connect desktops to the Internet. That's because both Microsoft® Windows® 95 and Windows NT® Workstation operating systems have all the "plumbing" built right in. Viewing content is just as effortless. With Microsoft Internet Explorer, users can browse the Internet (or internal corporate webs) whether they're working on the Windows platform or on the Macintosh.™

Of course, making web content easy to view is only the beginning. To be useful to organizations, content has to be easy to create, too. Which is why the latest generation of Microsoft Office applications, along with Internet Assistants, allow users to develop web content without programming. They simply save their work as HTML, the way they would any other document. Such ease-of-use also extends to the newest member of the Microsoft Office family, the Microsoft FrontPage™ web authoring tool, which lets users create and manage entire web sites, even if they've never so much as programmed a VCR.

The Internet is very much a part of our BackOffice™ family, too. With Microsoft Internet Information Server, we've extended the performance of Windows NT Server to make the ideal Internet platform. Now every organization can host and manage web content and applications securely and reliably. And, with Microsoft Exchange Server, secure and reliable e-mail is also a reality, whether it's traveling over the Internet or within your organization.

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Can ATM save the Internet?

By Michael Cooney
Dallas

Is ATM technology the Internet's caped crusader?

The technology's advocates believe it is, arguing that Asynchronous Transfer Mode is the best way to prevent the overburdened 'Net from melting down.

GETTING OUT OF CONTROL?

- According to the latest Zona Research Webcrawler survey, connection time-outs on the Internet rose from 18% to 34% in the past 5 months.
- The growth rate of Internet traffic is over 118% per year, according to various industry surveys.
- The capacity of existing voice/data networks will be equaled by the capacity demands of the Internet by the year 2000 .

SOURCE: ADVANCED TELECOMMUNICATIONS MODULES, SUNNYVALE, CALIF.

Users and other industry luminaries attending last week's ATM Forum-backed Global Enterprise Network Users Summit Conference (GENUS) said the Internet is bursting at its seams, that brownouts are becoming common occurrences and exponentially, more users and businesses are relying on its services daily (see graphic). The answer: tie ATM technology more deeply into the core of the 'Net.

But that might be easier said than done. The ATM industry is in a struggle of its own, trying to establish a place in the face of IP switching, gigabit Ethernet and other technologies that threaten its industry acceptance (*NW*, May 13, page 1).

A warm reception by the TCP/IP and Internet community is far from a foregone conclusion. In fact, there is evidence the two industries could damage each other in the long run by fighting over items such as multiprotocol flow control and bandwidth reservation schemes, analysts said.

Another Chernobyl?

"We are on the verge of an Internet meltdown," predicted Fred Sammartino, one of the original founders of the ATM Forum and vice president of business development for Advanced Telecommunications Modules, Inc. in Sunnyvale, Calif. "Getting ATM into the Internet infrastructure is one of the fastest ways we can prevent that from happening," he said.

The more the 'Net grows, the more loss and retransmission of data occurs. Eventually, gridlock will set in, added Lawrence Roberts, president of ATM systems for Connectware, Inc.

"The promise of ATM in the Internet backbone is to make it faster and provide much more bandwidth, but the mapping of TCP/IP, [Multiprotocol over ATM] and the other items needed to make it work are daunting," said Lawrence Lang, vice president of product management at Ipsilon Networks, Inc., an IP switch maker in Palo Alto, Calif.

Ipsilon is promoting its IP switching technology as a way for Internet service providers (ISP) to pump up the speed of the Internet quickly. And because IP switching technology already uses TCP/IP, it would eliminate the mapping issues that will effect the deployment of other technologies. Lang said Ipsilon does have some support in this venture.

"No question ATM would help the Internet better handle isochronous traffic, but it's the [available bit rate] technology that will have the biggest impact," said George Dobrowski, chairman of the technical committee for the ATM Forum.

"The Internet has no way of addressing the mix of voice, video and data traffic that ABR does."

ABR is a key data flow control specification that defines how ATM devices can utilize unused portions of ATM net bandwidth. The ATM Forum approved the ABR 4.0 specification two weeks ago, and it could be implemented in products by year-end.

Internet backers, however, said that the Resource Reservation Protocol (RSVP) is analogous to ABR and will obviate the need for it and ATM. The basic premise of RSVP is to enable routers to carve out a slice of bandwidth along a data route to ensure the proper, on-time, stable performance of video, audio and voice — things most TCP/IP-based nets lack.

ATM vendors could deploy RSVP, analysts said, but that spirit of cooperation has not been promoted between the TCP/IP and ATM camps.

The problem is, of course, that no vendors have RSVP in product form yet, even though the IETF defined it over a year ago.

Some users said that despite all the efforts of both the Internet and ATM camps, the question may be moot.

"ATM may not be enough to help the Internet," said Linda Winkler, manager of the advanced networking in the electronics and computing technologies division at the Argonne National Laboratory in Argonne, Ill. "The answer for us and other research facilities and universities is to set up an alternative network to the Internet."

Winkler said the Internet's burgeoning success has hampered some of the original work it was designed to do, particularly the free exchange of research between universities.

"It's hard for our researchers to exchange work over the Internet when it's so congested or down for one reason or another, which is happening with increasing frequency," she said. "When features such as ABR accompany ATM on the backbone, maybe it'll help." ■

Edify software to let banks open doors online

By Ellen Messmer
Santa Clara, Calif.

Edify Corp. today will announce software that financial institutions can use to deliver a range of home banking services to customers over the Internet.

Visa International, Inc. intends to recommend the Edify Electronic Banking System software, which has a link to the Visa bill-paying network, to its bank members.

However, Visa denied it is abandoning efforts to develop its own three-dimensional bank software for the World-wide Web based on the Virtual Reality Markup Language.

"Edify is the first, but it won't be the only one we'll recommend for bank software," a Visa spokesman said.

Edify's server-based application sits behind the Web server at the bank site and lets each bank customize the user interface with its own logo and brand of account services.

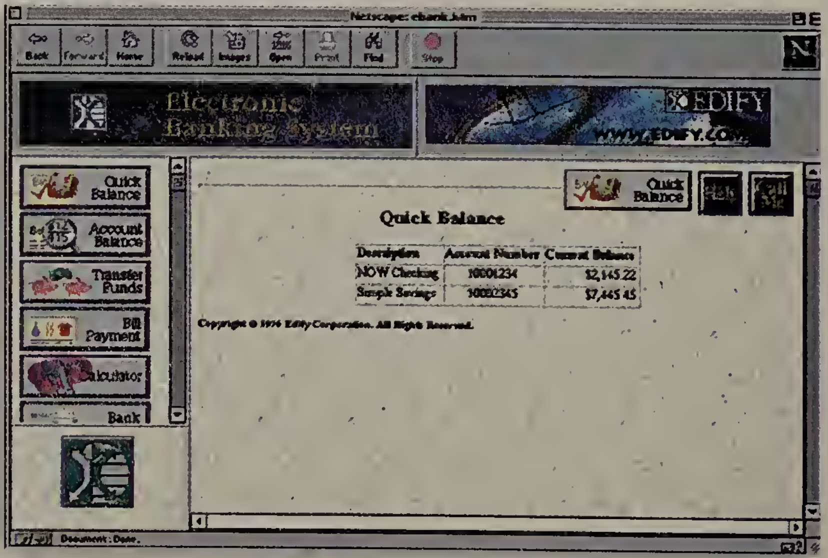
The application can be accessed via Web browsers that support HTML framing, including Netscape Communications Corp.'s Navigator 2.0 and Microsoft Corp.'s Explorer 3.0.

The bank customer, entering a password that gets encrypted via a Common Gateway Interface link, will be able to transfer money between accounts, check balances and ask for other banking services.

Pittsburgh-based Dollar Bank will be among the first institutions to beta-test the software, according to William Soward, director of applications marketing for Edify.

The software, expected to cost about $195,000, will be ready this summer.

©Edify: (408) 982-2000.



Quick Balance

Description	Account Number	Current Balance
NOW Checking	10001234	$2,145.22
Sample Savings	10002345	$7,445.45

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Edify's *Electronic Banking System lets users make online transactions.*

Failover software

Vinca opens up NetWare server backup package

By Ben Heskett
Orem, Utah

Vinca Corp. this week will announce a software-only version of its NetWare server backup product that lets a downed primary server pass off its work to a secondary server across LAN or WAN links.

StandbyServer for NetWare 2.0 will enable customers to link primary and backup servers via a variety of network types, including FDDI, Asynchronous Transfer Mode and 100M bit/sec Ethernet. Previously, the software came packaged with a serial EISA link that had to be used to connect the servers.

In addition, Version 2.0 will let users back up a server with a different model server. And the secondary server can service its own clients while taking over for a failed primary server.

The more flexible Vinca architecture should enable the company to offer a wider array of products in the future, according to Joe Barkan, an analyst at Gartner Group, Inc., a Stamford, Conn.-based consultancy.

However, new uses for the Vinca products over the WAN would raise concerns about bandwidth.

"It's nice to have [WAN] capacity, but I think someone would really want to think long and hard before they [back up servers across a WAN] because of the traffic that it would generate," noted Paul Cook, a systems specialist at Utah State University, which is using StandbyServer to back up an electronic mail server.

VINCA'S STANDBYSERVER FOR NETWARE 2.0

Features:	Allows a mirrored standby server to take over immediately if a primary server has a hardware or software failure.
Price:	**$2,999**
Availability:	Now

Users can soon expect from Vinca a RAID-style software product that will let any server on a LAN failover to the same backup server.

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CORRECTIONS

A photo of Bell Atlantic Chairman and Chief Executive Officer Ray Smith was incorrectly identified on page 64 of last week's issue.

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Introducing NetShelter—a high quality, free-standing rack enclosure for storing all your network and power protection equipment. NetShelter saves floor space, eliminates cabling "rat's nests," and physically protects your equipment to keep your network running—all in an attractive, user friendly design. When integrated with APC's power protection, management, and environmental monitoring options, NetShelter provides a total solution for protecting your network environment.

DESIGNED FOR EASY SELECTION AND EASY INSTALLATION

NetShelter provides 73.5 vertical inches (42U) for industry-standard, 19-inch, rack-mount equipment as well as computer-grade ventilation to reduce heat build-up. There's no need to spend hours selecting from dozens of configurations. APC makes it easy, with a complete rack package right out of the box, requiring no cabinet assembly. The unit fits through standard office doors (unlike other racks... surprise!) and rolls into place on its integrated stabilizing feet and heavy duty casters. Back rails can be repositioned to various depths and cross members can be relocated for side-mounted equipment and convenient cable management.

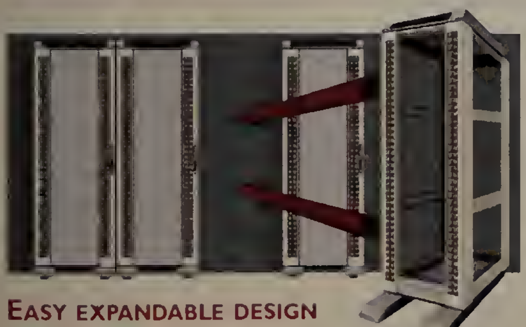
THE EASY ACCESS YOU WANT THE SECURITY YOU NEED

Access to the sides of the cabinet for equipment installation and service is provided in seconds by simply unlatching the locking side panels.

Moreover, locking handles in both the front and rear provide a tamper resistant environment. Optional switch kit combined with an APC Measure-UPS permits cabinet access monitoring for remote locations or during non-business hours.

FULL COMPAQ® COMPATIBLE RACK FOR 20% LESS

Choose APC NetShelter for easy installation of Compaq's Rack-Mountable ProLiant® Server line, external disk storage and accessories with our optional mounting kit, at a total price much less then comparable premium enclosures. NetShelter's fully ventilated design exceeds Compaq's requirements for third-party racks.



EASY EXPANDABLE DESIGN FOR GROWING SYSTEMS

When your system needs exceed one cabinet, you can easily create a bay of connected NetShelters in minutes! Unlike other rack enclosures, NetShelter expansion requires minimal time, cost and ports. Simply connect your first NetShelter to our expansion model that includes preinstalled baying hardware and use the side panels from your original.

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ANS002

UPS power management and diagnostic features increase uptime, reduce staff costs

PowerChute plus offers unattended system Shutdown, extensive UPS testing/status, Remote UPS management and Environmental/power monitoring so you can head off potential downtime. For SNMP-based WANs, APC's PowerNet provides comprehensive control from your network management console.

Share-UPS™ offers reliable shutdown for multiple servers even for different OSs

Provides a rack mountable solution for unattended safe shutdown of up to 8 servers (running the same or even different operating systems)-all from one UPS. Now you don't have to buy a separate UPS for each server in a mixed-OS environment.

Measure-UPS™ monitors NetShelter's environment even during power outages

APC's Measure-UPS prevents data or hardware damage by monitoring temperature, humidity, physical access and other external sensors. When alarm conditions occur, Measure-UPS along with APC software or hardware accessories can alert you and initiate a safe system shutdown. Moreover, network management nightmares like unauthorized access can be easily monitored with our Measure-UPS switch kit for NetShelter door openings.

ProtectNet™ data & network surge protection blocks "backdoor" surge damage, guaranteed to $50,000

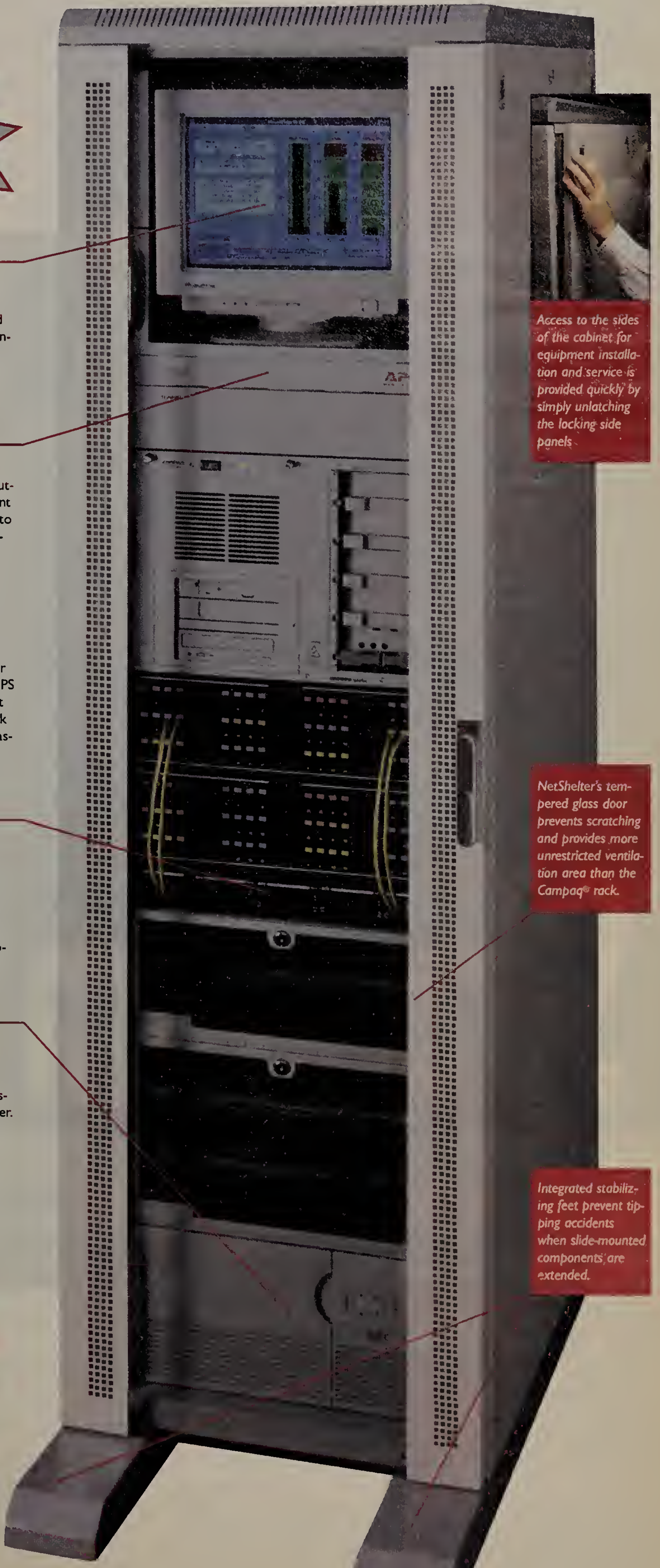
Multi-port rack-mountable modules (PNET4) protect your Ethernet and token ring network from lightning and surge events. Also available in telephone (PTEL1-4). When used with an APC UPS to completely bulletproof your system, APC provides up to a $50,000 repair/replace policy on protected equipment (see policy for details).

Smart-UPS RM rack-mount UPS provides performance power management for advanced networks

The ideal uninterruptible power supply (UPS) for rack mounted file servers, hubs, routers, telecommunications systems and other mission-critical equipment within NetShelter.

A few of Smart-UPS RM award winning features:

- SmartSlot™ accessories offer custom functionality.
- SmartBoost™ and SmartTrim™ correct under and overvoltages without battery drain.
- QuickSwap™ allows safe and easy replacement of batteries while the system stays up
- 100% compatibility with Compaq® rack servers and Insight Manager



Access to the sides of the cabinet for equipment installation and service is provided quickly by simply unlatching the locking side panels

NetShelter's tempered glass door prevents scratching and provides more unrestricted ventilation area than the Campaq® rack.

Integrated stabilizing feet prevent tipping accidents when slide-mounted components are extended.

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Circle Reader Service #44

WANs & Internetworking

Covering: Network Architectures and Management • Routers • Muxes, Remote Access Gear, Modems, PBXs and other CPE • Mobile Computing Products

Briefs

■ **Pure Data, Ltd.** *and* **Alpha-Net Telecom, Inc.** *have entered a technology alliance to develop a* **fax modem that uses the Internet** *rather than long-distance carriers. It would combine Pure Data's SatisFAXtion hardware with AlphaNet's planned UniPost Internet services.*

■ **Intel Corp.** *and Broadband Technologies, Inc. have agreed to work on a* **fiber-to-the-curb PC card** *for deployment sometime next year. To date, fiber-to-the-curb service is limited to trials only. It is regarded as a way to deliver broadband Internet access, LAN access and TV over a single connection, but would require extensive rewiring by carriers.*

■ **U.S. Robotics** *last week announced* **price reductions** *for its NetServer eight- and 16-port dial-up remote access servers. List price for the eight-port model dropped from $7,995 to $4,495, and the 16-port model dropped from $11,995 to $8,495.*

U.S. Robotics: (708) 982-5010.

■ **Hewlett-Packard Co.** *last week unveiled a* **frame relay WAN monitoring** *device for gauging the performance of frame relay links. The HP NetMetrix/Win32 for WAN runs on Windows 95, Windows NT and Unix workstations. It includes mid-level manager applications for scalability, stand-alone probes for remote links, a de facto standard Management Information Base, and planning and reporting capabilities.*

HP NetMetrix/Win32 for WAN is priced from $995 to $7,200. All components will be available in October.

HP: (800) 752-0900.

■ **Continental Airlines Corp.** *is replacing a 23-year-old Galaxy* **automatic call distributor (ACD)** *from Rockwell International Corp.'s Switching Systems Division with five of Rockwell's newer Spectrum ACDs. The new systems will be placed in two Houston call centers as well as one each in Denver, Salt Lake City and Tampa, Fla.*

POTS does double duty

By Tim Greene
Largo, Fla.

Users who need the simultaneous voice and data (SVD) functionality of ISDN but don't want to spend the bucks can look to AT&T Paradyne for a plain old telephone service option.

AT&T Paradyne last week introduced a way for central sites to support SVD calls from remote users dialing in over standard voice phone lines. And for remote users who need transmission rates faster than 28.8K bit/sec, the same AT&T Paradyne 2290 Dial Server also supports ISDN, which offers dial-up speeds up to 128K bit/sec.

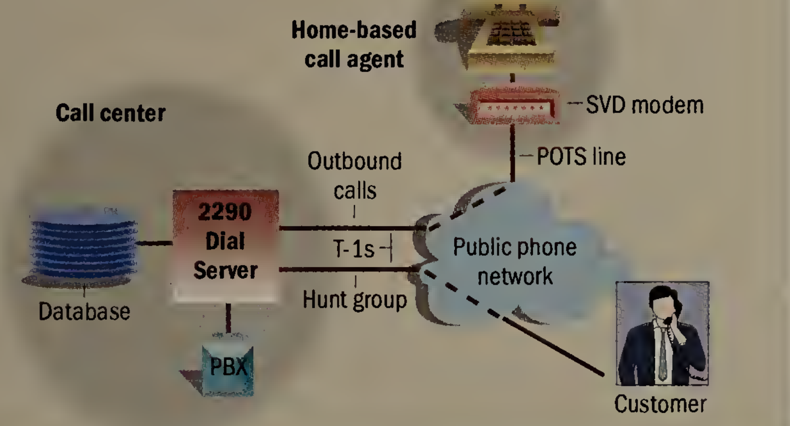
SVD benefits include whiteboards and voice calls over the same line; call-center database access for home agents as they talk to customers; and full and simultaneous access to the corporate LAN and phone system for telecommuters.

The 2290 will only support data only when it ships in July, but an SVD software download will be available by the end of the

See **Paradyne,** *page 22*

Call center extender

AT&T Paradyne's 2290 Dial Server will let remote call agents talk to customers and dip into central databases over a single POTS line using simultaneous voice and data (SVD) technology.



Wall Street firm taps multiple integrators

By Joanie Wexler
New York

Investment house J.P. Morgan last week set a new example in the outsourcing arena, announcing a four-way deal with integrators that will each handle an aspect of the firm's global information technology operations.

The four firms, Andersen Consulting, AT&T Solutions, Bell Atlantic Networks Integration (BANI) and lead partner Computer Sciences Corp. (CSC) have formed an alliance that will operate as part of the J.P. Morgan technology team.

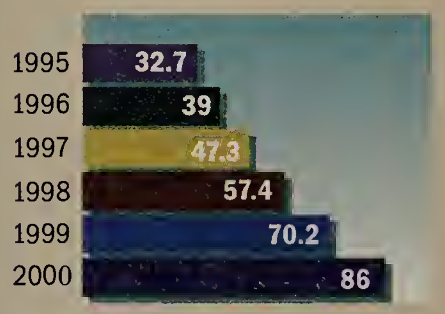
On the network side, AT&T Solutions has responsibility for global voice and data network operations management. BANI will manage the company's LANs, desktops and servers.

The partners' responsibilities cover about a third of J.P. Morgan's $1 billion annual technology budget. While much of the outsourcing resources are earmarked for operational expenses, they also cover some application development and new technology decision-making and deployment.

Outward bound

Worldwide information technology outsourcing revenue is expected to grow 25% per year.*

In billions of dollars



* Reflects minimum three years' management of some combination of network, data center, client/server applications and desktop processes.

SOURCE: G2 RESEARCH, INC., MOUNTAIN VIEW, CALIF.

While J.P. Morgan expects to save about $45 million a year with the deal, its primary objective "is tipped toward having access to skills and resources" needed in the hotly competitive trading industry, said Thomas Hynd, J.P. Morgan vice president and project manager for the technology alliance.

The firm tends to move quickly in and out of businesses while developing new network-based, lightning-quick products to serve traders. This makes it difficult to keep in-house expertise and technology investments current, Hynd said.

J.P. Morgan did not necessarily buy in to the marketing-speak of outsourcers that claim to do it all. Instead, it issued a bid challenging players to bring it the best-of-breed capabilities in networking, data center operations and application development, whether alone or with other partners, Hynd said. The winning members chose one another as the team.

To date, it has been more common for companies to outtask certain operations on a smaller scale, often to multiple

See **J.P. Morgan,** *page 22*

IDEA targets SNA users with 'Net access wares

By Michael Cooney
Billerica, Mass.

SNA users looking for a quick and easy way to jump on the fast-moving Internet bandwagon can now turn to a new line of products from IDEA.

IDEA's recently announced suite of Internet access products will let traditional 3270 and 5250 terminals gain access to resources on the Internet and corporate intranets.

IDEA estimates that there are over four million mainframe 3270 and mid-range 5250 terminals in the market that could need Internet access in the next few years. Less than 5% of those devices have any sort of Internet or intranet access today, said Mike Chatterton, product-line manager for IDEA's Internet product family.

Central to the rollout is its new Internet Terminal Server (ITS), a PC-based remote controller device that lets 16 to 64 SNA users access the 'Net for Web browsing, Internet electronic mail and other TCP/IP-based services such as File Transfer Protocol. The second new IDEA product, the Internet Host Server (IHS), functions the same way as the ITS in that it converts 3270 and 5250 datastreams into HTML, but the goal is the opposite. IHS resides at the data center and allows users with existing browsers to access SNA data on the mainframe or mid-range host.

The final component of the IDEA foray is the Internet Client Station (ICS), a Reduced Instruction Set Computing-based diskless workstation that will combine integrated SNA, TCP/IP, Internet browser and Java applet support in one box. The ICS will give businesses an inexpensive, integrated box they can just plug in to their workgroups, Chatterton said.

"The ICS is based on the Oracle Internet station design and will cost between $750 and $1,250," he said.

See **IDEA,** *page 22*

THE INTERNET OPPORTUNITY

By the year 2000, there will be:

- More than 120 million installed Internet seats
- More than 60 million installed intranet seats
- More than 30,000 SNA hosts and 150,000 AS/400 hosts, representing 4 million seats that could want Internet and/or intranet access.

SOURCE: IDEA, BILLERICA, MASS.

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J.P. Morgan

Continued from page 19

partners that do not work together, said Tom Sweeny, director of network integration and support services at Dataquest Worldwide IT Services, in Westborough, Mass.

With the J.P. Morgan arrangement, though, all the partners will integrate their systems for a "holistic view of the Morgan environment," said Rick Roscitt, managing partner in the AT&T Solutions worldwide outsourcing practice.

"On paper, this [alliance] is ideal," Sweeny said. He predicted one challenge will be keeping the partners focused on their assignment since each has some services that overlap with others.

On the other hand, the company gets the benefit of working with a single source — data center management partner CSC, which coordinates alliance activities — "while enjoying the cross-pollination of strengths of each of the members," said Alex White, senior analyst at G2 Research, Inc. in Mountain View, Calif.

There are about 900 J.P. Morgan employees whose jobs fall into the purview of the alliance. The company said they will all receive job offers from alliance companies and may continue to work at J.P. Morgan locations. ■

Paradyne

Continued from page 19

year, said Joseph Assenheim, senior marketing manager at AT&T Paradyne.

The 2290 Dial Server consists of server cards and software that are compatible with Microsoft Corp. Windows NT or Novell, Inc. NetWare.

The package includes a network interface card with two T-1 or Primary Rate Interface ISDN ports, and communications device cards that connect as many as eight communications devices. Users who want both analog and ISDN access would have to use a PRI line.

To take advantage of the server, the remote user would need an SVD-capable modem. However, Assenheim said the company has agreements in the works with modem vendors that plan to make SVD modems compatible with the 2290 Dial Server.

AT&T Paradyne's SVD server supports two proposed standards now being considered by the International Telecommunication Union, one for data rates of 14.4K bit/sec and another for 28.8K bit/sec. Both support voice.

AT&T Paradyne uses analog SVD, a competitor of digital SVD, said Lisa Pelgrim, an analyst at Dataquest, Inc. in San Jose, Calif.

Analog applies to the voice part of the call that gives better voice quality than digital. Analog SVD also allows users to decrease the quality of the voice part to allow for higher data throughput during SVD sessions, she said.

Minimum configuration of a data-only fractional T-1 costs $9,995; a full T-1 configuration costs $21,985. The SVD software upgrade has not been priced yet. ■

IDEA

Continued from page 19

The company joins IBM and others that are rushing to provide 3270 and 5250 users with access to the Internet and intranet resources. IBM last month said it hopes to provide 3270 and 5250 users access to the Internet later this year (*NW*, April 22, page 1).

"Opening the legacy world up to the Internet and intranet environments is a big market opportunity for IBM and others," said Frank Dzubeck, president of Communications Network Architects, Inc., a consultancy in Washington, D.C.

ITS is available starting at $3,980, which includes a 16-user license. IHS and the ICS will be available in the third quarter. Pricing for the IHS has not been set. IDEA also announced ITS will be sold by Memorex Telex Corp.

©IDEA: (617) 275-2800.

Grab details on IBM's plans to Web-enable 3270 terminals on Network World Fusion. Select News+ then WANs & Internetworking.

Network World Fusion
http://www.nwfusion.com

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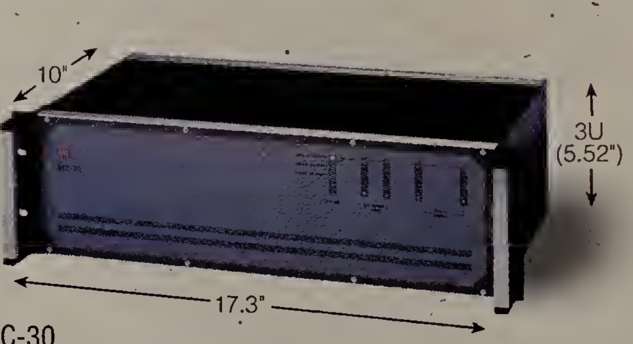

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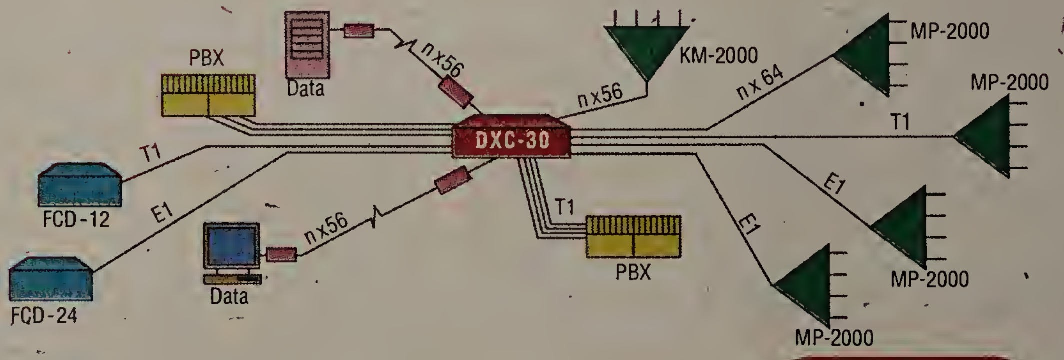

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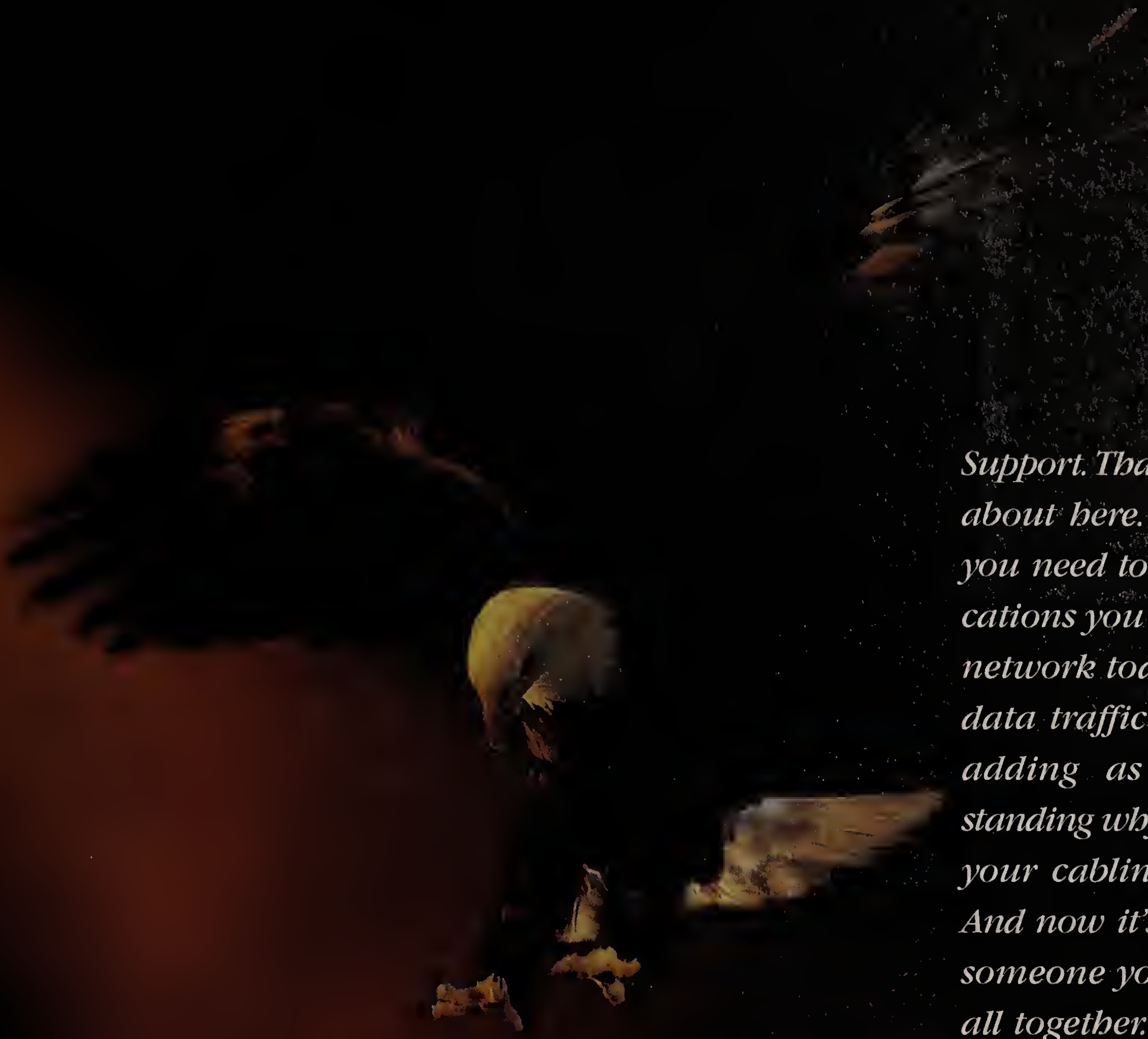

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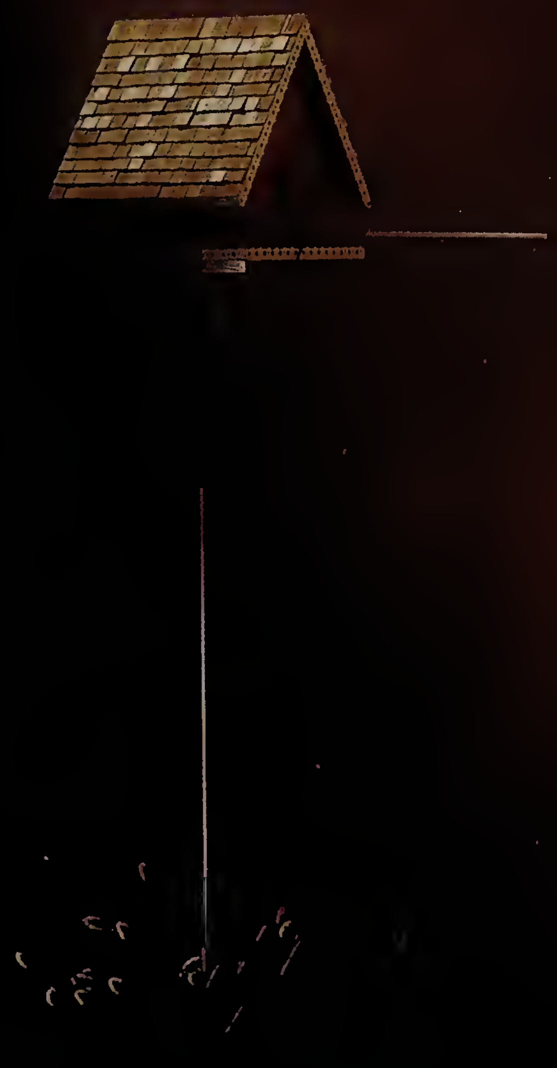

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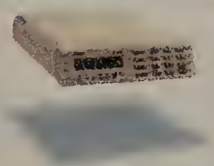

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Network analysis hits new cost/performance curve

By Jim Duffy

Two network management vendors have unveiled products they claim drastically lower the price of network analysis and related tasks.

Start-up Shomiti Systems, Inc. rolled out network analysis hardware and software for surveying the performance of high-speed LANs. And Ipswitch, Inc. began shipping a monitoring system for TCP/IP networks that lets users oversee any networked device on the Internet, corporate intranets or TCP/IP LANs.

Shomiti's Century product line is intended to address the shortcomings of traditional network analysis tools, which lack the capacity to capably monitor fast LANs.

One Fast Ethernet link, for example, forwards 148,000 packet/sec. A switched link can forward over 1,000,000 packet/sec, yet today's probes and analyzers can only capture 3,000 to 60,000 packet/sec, Shomiti claims.

Shomiti's solution is an ISA-based PC network interface card with a dedicated CPU and buffer memory. The device is designed to overcome the bottlenecks of conventional tools that share a PC's main CPU and memory with operating system and application software. The Century Media Module features 100M bit/sec Fast Ethernet and 10M bit/sec Ethernet links for capturing packets at wire speed on switch-to-switch and switch-to-server connections.

A PC can house as many as eight Century Media Modules in its expansion slots, accommodating the analysis of eight concurrent shared, switched or full-duplex Ethernet segments. This configuration delivers an aggregate capture rate of 1,000,000 packet/sec, the company said.

Packets can be viewed through Shomiti's Century LAN Analyzer software, which runs on Windows 3.1 and Windows 95 workstations. Century LAN Analyzer provides seven-layer protocol decoding and can also generate packets for network and device testing.

Shomiti has also unwrapped Century Tap, a multiport hardware device for monitoring full-duplex connections. Century Tap enables Century LAN Analyzer to scrutinize traffic running in both directions of a full-duplex link, whereas traditional analyzers can only view unidirectional traffic over point-to-point half-duplex links, the company said.

One of the challenges that start-up Shomiti faces will be continued, timely development of innovative products to compete with established vendors such as Network General Corp., said John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo.

The Century Media Module costs $7,499, which is about half the average price of a stand-alone network analyzer. Century LAN Analyzer costs $499; Century Tap costs $399. All of the products are available now.

Also available is Ipswitch's WhatsUp, software that checks the status of any device with an IP address. The software alerts administrators via an audible or visual alarm at the desktop, a pre-scripted electronic mail message or pager.

WhatsUp costs $149.

☎Shomiti: (888) 746-6484; Ipswitch: (617) 676-5700.

START-UP SHOMITI AT A GLANCE

Founded:	April 1995
Headquarters:	San Jose, Calif.
Employees:	13
Management:	Som Sikdar, president and and CEO; Yancy Lind, vice president of marketing
Investors:	Sequoia Capital and Sevin Rosen Funds
Products:	Century line of hardware and software for analysis of high-speed LANs.

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U.S. Robotics manufactured the 50,000 modems and remote access server technology that make ANSnet one of the largest, high-speed dial access networks in existence. It's part of the mission critical network **America Online** relies on to provide dial access to AOL's five million subscribers, and it supports more than a million sessions each day. You'll also find **GNN**, one of today's fastest growing Internet access services, whose massive server complex was designed, implemented, operated and managed by ANS.

Look further and you'll learn that ANS pioneered the use of TCP/IP technology and Internet security—just some of the reasons **Trane**, a $3 billion global company, chose ANS to design, deploy and manage its 140-site virtual private data network.

You'll see why **Hewlett-Packard** teamed with ANS to offer Managed Intranet Solutions, which utilize Internet and Web technologies to create internal corporate information networks. You'll also discover how **Bay Networks'** high performance, high availability Backbone Concentrator Node routers are extending ANS' reputation for reliable, secure and scalable backbone network performance.

In fact, 30 of the Fortune 100 companies look to ANS for their networking solutions. ANS' 56K to T3 dedicated attachments come complete with the world's leading routers made by **Cisco Systems**. Whether it's connections, firewall security, Web hosting, VPDNs or Intranets, **ANS** has a solution that's right for your company.

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*July, 1996

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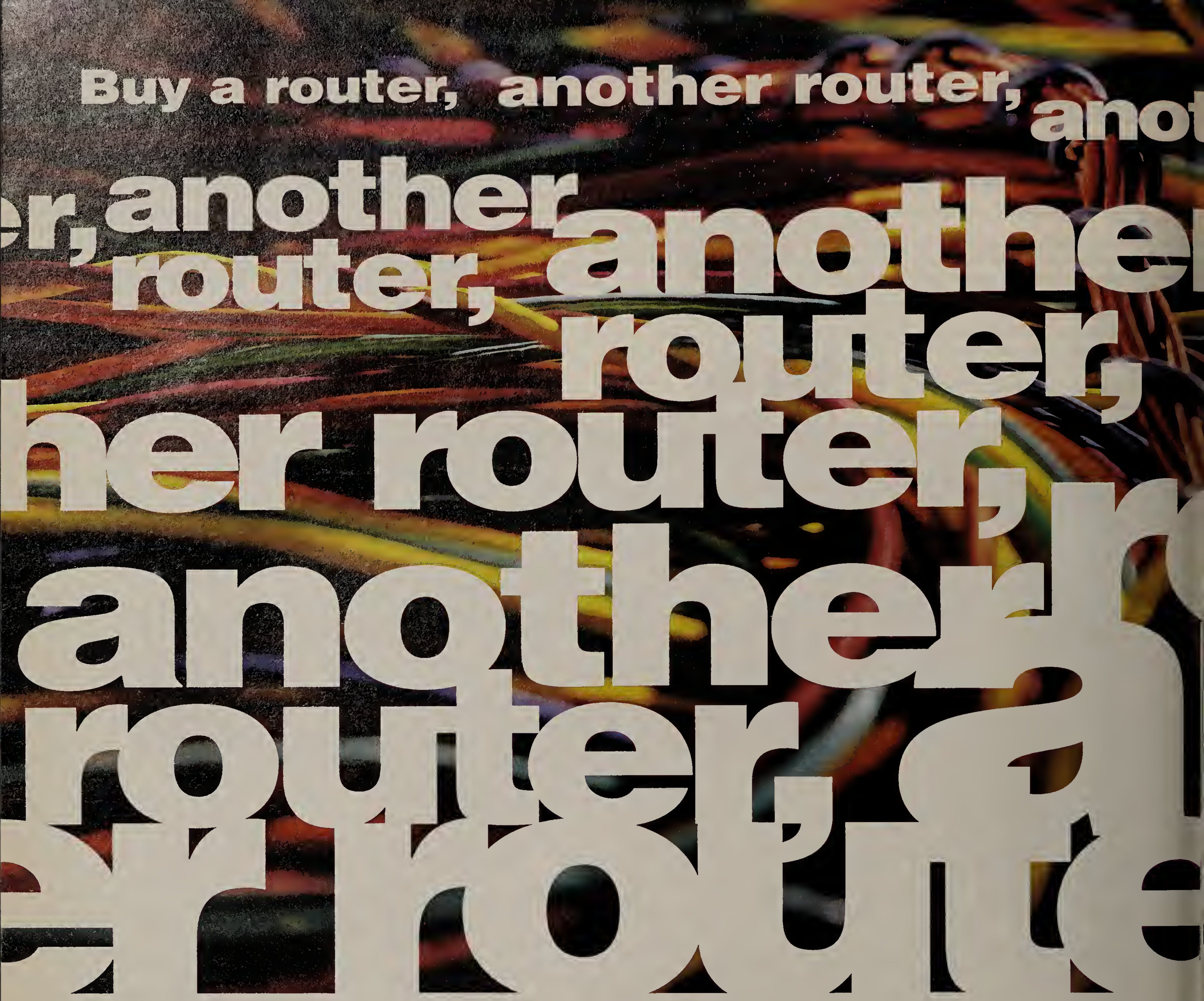
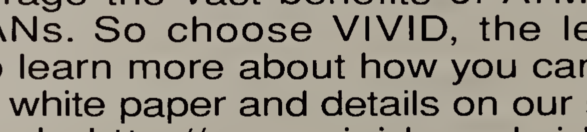


Or buy 

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Circle Reader Service **#36**

Carrier Services

Covering: Local and Long-Distance Services • Value-Added Networks • Cable, Satellite and Wireless Networks • Regulatory Affairs • Carrier-Based Internet Services

Briefs

■ **AT&T** *last week said it is offering a new* **service-level guarantee** *on its Accunet private-line services. Its Enhanced Reliability Option (ERO) guarantees customers 99.99% circuit availability for its dedicated T-1 and T-3 services and associated access lines.*

If an ERO-guaranteed circuit is down for five or more cumulative minutes in a month, AT&T will credit the customer 100% of that month's end-to-end cost of the total covered circuit. The catch: Users pay a 20% premium on the interoffice channel portion of their circuits for the insurance.

■ **AT&T** *last week said it will partner with Kokusai Denshin Denwa of Japan to test* **interoperability of broadband networks** *between the U.S. and Japan starting in September.*

■ **Bell Atlantic Corp.'s** *Large Business Services division last week announced* **simpiified customized billing** *called expressTrak that is easier to understand and available on paper, CD-ROM, magnetic tape or online.*

The group also plans to include wireless and long-distance services in its All@once network integration offerings. In addition, the company announced it has expanded its marketing alliance with Cisco Systems, Inc. to include remote LAN access ISDN routers, the Cisco 1000 or 2500 series.

■ **Cable & Wireless plc** *has named a* **new chief executive officer,** *Richard Brown, the current CEO of H & R Block, Inc., which owns CompuServe, Inc. Brown, who formerly was vice chairman of Ameritech Corp., takes over for acting CEO Rod Olsen. Olsen will oversee Cable & Wireless' Asia Pacific holdings.*

■ *Equipment provider* **Tie Communications, Inc.** *will begin selling the* **long-distance services** *of Seattle-based Midcom Communications, Inc. The companies hope to achieve a target of $36 million in sales over the three-year term of the contract.*

FCC respondents say no ban on 'Net phones

By David Rohde
Washington, D.C.

If hardly anyone is using the Internet to make telephone calls, you couldn't tell by the response to a carrier group's call to outlaw the activity.

The Federal Communications Commission has received hundreds of comments on a petition by the America's Carriers Telecommunication Association (ACTA) to ban sales of software to enable Internet voice connections (*NW*, May 13, page 23). Virtually all the respondents opposed the petition.

But some large carriers supported the ACTA's additional call for the FCC to determine whether Internet service providers (ISP) should pay switched access and universal service charges routinely borne by long-distance carriers. US WEST, Inc. attorney Robert McKenna said ISPs should be required to pay switched access charges to local exchange carriers because the traffic is ultimately bound for interexchange destinations.

To do that, the FCC would either have to initiate an investigation of Internet telephony or address software providers and ISPs in new rules on access charges and universal service subsidies.

Leading Internet industry vendors shuddered even at that approach. Attorneys for Netscape Communications Corp. said the mere act of considering new rules would help the ACTA achieve one of its goals — to create a climate of regulatory uncertainty that will slow down the development of Internet telephony.

Many respondents said any new regulation would not work because the Internet does not distinguish among data, voice or image content within IP packets, and traffic is routed through a maze of connections.

Sprint Corp. attorney Norina Moy agreed. "There is no way to enforce a ban on the use of Internet telephone software or to ensure that telephone conversations using such software are assessed usage-sensitive access charges," she said.

The response to the ACTA petition represented the first time the FCC has accepted formal comments on a specific proceeding via electronic mail.

But most of the E-mail responses did not address the ACTA's core complaint.

Some of the E-mail respondents also misunderstood the proceeding, assuming the FCC was itself proposing to regulate Internet telephony rather than soliciting comments on someone else's idea.

"I am alarmed by the willingness of the FCC to strangle one of the newest industries on the Internet," one respondent replied.

Said another: "Do not stop the use of the Internet for voice. What should be stopped is the FCC." ■

AT&T sells insurers on the Web

By Joanie Wexler
Lake Buena Vista, Fla.

AT&T last week launched document archiving and Internet-based hosting services for the insurance industry.

At a conference here, AT&T introduced a Web-based version of its InView Service, an automated way for independent insurance agents to access insurance rates, write policies, submit claims and track billing.

The Web-based AT&T Property and Casualty Insurance Services is a successor to the DOS-based InView, which runs on AT&T's X.25 Information Access Service. With InView, agents have historically used special software to tap a Web site hosting information about 35 AT&T insurance company customers, said Robert Portrie, insurance market director for AT&T. There are about 4,000 agencies using the system, he said.

Now, agents will be able to get at that same information using a Web browser. Consumers also can compare rates and check their bills on the Web site, Portrie said.

The insurance companies providing the content are charged 50 cents to $1.50 each time a transaction takes place.

AT&T also introduced Easy Archiving, which offloads the storage of policies and the data associated with them — such as claims and electronic mail correspondence — to a central data center.

The data center for Easy Archiving is provided by AT&T partner Aegis Star, a Pleasanton, Calif., firm specializing in data capture and high-speed retrieval.

Individual documents are indexed in a way that reportedly allows them to be retrieved, regardless of volume, in 15 seconds. The documents are then delivered to the customer by E-mail. ■

Subscriber Line Charge headed up

By David Rohde
Washington, D.C.

Check out the small print on your local carrier's monthly bill and you will probably find a $6-per-line fee under the term Subscriber Line Charge (SLC).

Mark that entry with an asterisk from now on, because the SLC is likely to go up over the next year. By May 1997, when the Federal Communications Commission is required to institute new rules for carriers to pay for expanded universal telephone service, the figure could double, according to some estimates.

In a recent FCC filing, AT&T predicted the $3.50 SLC for single residential telephone lines will double to $7, with a proportional increase for the business multiline charge. Other groups are also predicting increases, but not as steep (see graphic).

But AT&T and several other carriers claimed the increase will not actually cause an overall cost boost for users. Reason: They are pleading for the FCC to remove a less explicit universal service fee, known as the Carrier Common Line Charge (CCLC).

The CCLC is paid by long-distance carriers as a small fraction of per-minute usage, and it does not appear as an explicit line item on customers' bills. AT&T and others have told the FCC that by passing the cost savings from the elimination of the CCLC onto users, the net effect will be no increase, or even a slight decrease, in user bills.

One influential group is not so sure. The National Association of Regulatory Utility Commissioners last month complained to the FCC that raising the SLC could reduce the number of people who own telephones.

The SLC was introduced in 1985 to help local exchange carriers recover the cost of building access lines throughout their communities. The CCLC is designed to force long-distance carriers, which do not have local-loop responsibilities but benefit from access lines, to contribute to the effort. The SLC has been the source of more controversy than the CCLC, largely because the charge appears on telephone bills. ■

REQUIRED FEE HEADING UP

Under expanded universal service, the federal subscriber line charge will increase according to two key estimates.

	Single-line customers	Multiline customers
Current charge per phone line	$3.50	$6.00
Ad Hoc Telecommunications Users Committee estimate of future charge	$5.30	$8.33
AT&T estimate of future charge	$7.00	$12.00

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According to International Data Corporation (IDC), Intranets are growing faster than the Internet itself. The number of Intranet Web servers now comprise 55% of total internet servers and are expected to nearly triple in size this year to more than 200,000 and to exceed 4.5 million by the year 2000.

While Intranet Web servers today act mainly as document publishing systems, a number of vendors are now rapidly extending their functionality. For example, Web servers are being integrated with databases, linked to mainframes and other legacy systems, and providing workflow services. Combined with the high bandwidth capacity of corporate data networks, your organization can capitalize on advanced features such as real-time audio and video as well as collaborative applications and 3-D data representation.

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4. **Explore information publishing on your Intranet at the corporate, group and individual levels**
5. **Analyze the positioning of market leaders such as Microsoft, Netscape, Novell and Sun and how their plans will impact your Intranet solutions**
6. **Explore the future of Intranet technology with Sun's Java and the rendition of data in three dimensions with VRML**
7. **Learn the direction of Intranet-based groupware**
8. **Strategically plan your Intranet and quantify your Return-on-Investment**
9. **Learn how to select the best Web server products for your Intranet**
10. **Explore the theory and operation of Web servers**

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NEW YORK, NY	JUNE 3	PHILADELPHIA, PA	JULY 23
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IRVINE, CA	JUNE 11	DENVER, CO	AUGUST 5
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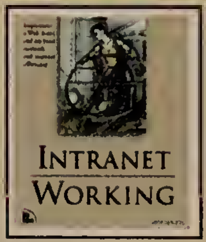

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WAN MONITOR

AT&T targets business credit cards

Soon, that Amex or Visa Gold card in your wallet might make way for a new AT&T-branded Universal Business MasterCard.

AT&T is going for the gold: It is finally launching a business-oriented Universal Card that ultimately may be combined with, say, your Software-Defined Network calling card and features. How about seven-digit dialing and account codes with your MasterCard? How about combining your travel and entertainment reporting with your phone calls when on the road?

AT&T's success in the credit card industry cannot be understated. Since its launch in 1990, the AT&T Universal Card has transformed the consumer credit card game. At that time, AT&T introduced not only a combined credit/calling/ATM card (that's the other ATM — automated teller machine — for all you data folks), but also changed the price paradigm for the credit card market. The Universal Card was free for life.

The new AT&T Universal Business MasterCard is being tested today, initially with small businesses.

Again, the card is free forever for the owner or president of the business. There is a $5 sign-up fee for each additional card for employees (but this is better than the $20 to $150 charged by other corporate credit card issuers).

The potential is endless, however, and that's the news. Imagine replacing AT&T's millions of calling cards with active credit cards. Businesses could utilize the Universal Business Card for all business-related expenses.

By utilizing the data gathered from transaction information, including customer purchasing and spending habits, AT&T will be well-placed to deliver the services its customers rely on to better manage their businesses. AT&T will be able to offer monthly expense distribution reports or provide budgets and forecasts.

Daniel Briere and Christine Heckart

Potentially, AT&T could use the Universal Business Card as the billing mechanism for all small business telecommuniations services.

Imagine having accrued, through several purchases, enough Bonus Rewards points to pay for your monthly telecommunications services. Even American Express would be challenged to match such a loyalty plan.

It is conceivable that AT&T's business loyalty program could be extended to the Universal Business Card. The consumer program True Rewards has already embraced the Universal Card with the Universal Rewards offering. This program offers bonus points that can be applied to several things: to lower a cardholder's annual percentage rate, to receive free long distance or to earn rewards for credit and cash.

The AT&T Business Universal Card could be used for electronic commerce transactions, billing wireless traffic and purchasing telecommunications equipment. A new Lucent 6730 digital phone would be nice, thank you.

Given the recent security measures AT&T has deployed, even WorldNet Internet service could be billed to the Universal Business Card. AT&T even provides financial liability protection for purchases made on the Internet with the Universal Card. So many opportunities, so little time. Look for big things from AT&T on this one.

Briere is president and Heckart is director of broadband with TeleChoice, Inc., a consultancy in Verona, N.J. They can be reached at dbriere @telechoice.com and checkart@telechoice.com.

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Lifetime Warranty	**YES**	**NO**	**NO**
TX and T4	**YES**	**NO**	**NO**

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1 Industry: (check one only)

01. ☐ Manufacturers (other)
02. ☐ Finance/Banking
03. ☐ Insurance/Real Estate/Legal
04. ☐ Health Care Services
05. ☐ Hospitality/Entertainment/Recreation
06. ☐ Media/TV/Cable/Radio/Print
07. ☐ Retail/Wholesale Trade/Business Services
08. ☐ Transportation
09. ☐ Utilities
10. ☐ Education
11. ☐ Process Industries (Mining/Construction/ Petroleum Refining/Agriculture/Forestry)
12. ☐ Government (Federal/State/Local)
13. ☐ Military
14. ☐ Aerospace
15. ☐ Consultants (Independent)
16. ☐ Carriers/Interconnects
17. ☐ Manufacturers (Computer/Communications)
18. ☐ Resellers of Computer/Network Products (VARs, VADs, Distributors)
19. ☐ Systems/Network Integrators
20. ☐ Distributors (Computer/Communications)
21. ☐ Other *(please specify)*_______________

2 What is your job function? (check one only)

NETWORK IS MANAGEMENT:

1. ☐ Networking Management
2. ☐ LAN Management
3. ☐ Datacom/Telecom Management
4. ☐ IS, IT, MIS, Systems Management
5. ☐ Engineering Management
6. ☐ Corporate Management (CIO, CEO, Pres., VP, Dir., Mgr., Financial Management)
7. ☐ Consultant (Independent)
8. ☐ Other *(please specify)*_______________

3 What is the total number of sites for which you have purchase influence? (check one only)

1. ☐ 100+
2. ☐ 50 - 99
3. ☐ 20 - 49
4. ☐ 10 - 19
5. ☐ 2 - 9
6. ☐ 1
7. ☐ None

4 What is your scope and involvement in purchasing decisions for network products & services for your enterprise?

A. SCOPE (check one only)

1. ☐ Corporate/Enterprise
2. ☐ Department
3. ☐ None

B. INVOLVEMENT (check all that apply)

1. ☐ Recommend/Specify
2. ☐ Approve
3. ☐ Evaluate
4. ☐ Determine the need
5. ☐ None

5 Check ALL that apply in Columns A and B:

A. I am involved in the purchase of the following products/services:
B. I plan to purchase the following products/services:

A B
☐ 100 ☐ **LOCAL-AREA NETWORKS**
☐ 01. ☐ Local-Area Networks
☐ 02. ☐ Network Op. Sys. Software
☐ 03. ☐ LAN Storage/Backup
☐ 04. ☐ Optical LAN Storage/Backup
☐ 05. ☐ Disk LAN Storage/Backup
☐ 06. ☐ Tape LAN Storage/Backup
☐ 07. ☐ RAID LAN Storage/Backup
☐ 08. ☐ Network Test/Diagnostic Tools
☐ 09. ☐ Cables, Connectors, Baluns
☐ 10. ☐ UPS
☐ 11. ☐ Network Interface Cards
☐ 12. ☐ Peer-to-Peer LANs
☐ 13. ☐ SNMP Network Management
☐ 14. ☐ ATM Switches
☐ 15. ☐ Token-Ring Switches
☐ 16. ☐ Ethernet Switches
☐ 17. ☐ Remote LAN Access/Communications Servers
☐ 18. ☐ Superservers
☐ 19. ☐ File/Application Servers
☐ 20. ☐ Print Servers

A B
☐ 101 ☐ **INTERNETWORKING**
☐ 21. ☐ Bridges
☐ 22. ☐ Routers
☐ 23. ☐ Bridge/Router
☐ 24. ☐ Gateways
☐ 25. ☐ Intelligent Hubs/Stackables

A B
☐ 102 ☐ **COMPUTERS/PERIPHERALS**
☐ 26. ☐ Laptops/Notebooks/Sub-Notebooks
☐ 27. ☐ Micros/PCs
☐ 28. ☐ Minis
☐ 29. ☐ Mainframes
☐ 30. ☐ Workstations
☐ 31. ☐ Terminals
☐ 32. ☐ Printers
☐ 33. ☐ Cluster Controllers
☐ 34. ☐ Monitors
☐ 35. ☐ Fax/Modem Boards

A B
☐ 103 ☐ **REMOTE/WIRELESS COMPUTING**
☐ 36. ☐ PDAs
☐ 37. ☐ PCMCIA Devices
☐ 38. ☐ Wireless Data Services
☐ 39. ☐ Wireless Data Equipment
☐ 40. ☐ Wireless LANs
☐ 41. ☐ Cellular Equipment & Services

A B
☐ 104 ☐ **INTERNET/ELECTRONIC COMMERCE**
☐ 42. ☐ Internet Access Providers
☐ 43. ☐ Firewalls
☐ 44. ☐ Web Servers/Browsers
☐ 45. ☐ Internet Software Tools

A B
☐ 105 ☐ **SOFTWARE/APPLICATIONS**
☐ 46. ☐ Network Management
☐ 47. ☐ Systems Management
☐ 48. ☐ Security
☐ 49. ☐ Communications Software
☐ 50. ☐ Terminal Emulation
☐ 51. ☐ Word Processing
☐ 52. ☐ Operating Systems
☐ 53. ☐ Client/Server Applications Development
☐ 54. ☐ Database Management/RDBMS
☐ 55. ☐ Spreadsheet
☐ 56. ☐ Groupware
☐ 57. ☐ EDI
☐ 58. ☐ E-mail
☐ 59. ☐ Windows/Graphical User Interface
☐ 60. ☐ Multimedia
☐ 61. ☐ Graphics/DTP
☐ 62. ☐ Remote Access
☐ 63. ☐ Imaging
☐ 64. ☐ Suites
☐ 65. ☐ Middleware
☐ 66. ☐ Document Management
☐ 67. ☐ Database Server
☐ 68. ☐ Site Metering Tools
☐ 69. ☐ Computer-Integrated Telephony (CIT)

A B
☐ 106 ☐ **WIDE-AREA NETWORK EQUIPMENT & SERVICES**
☐ 70. ☐ Frame Relay Equip./Services
☐ 71. ☐ Modems
☐ 72. ☐ FT-1/T-1/T-3 Multiplexers
☐ 73. ☐ FT-1/T-1/T-3 Services
☐ 74. ☐ SONET
☐ 75. ☐ Inverse Multiplexers
☐ 76. ☐ SMDS
☐ 77. ☐ Asynchronous Transfer Mode
☐ 78. ☐ Diagnostic/Test Equipment
☐ 79. ☐ DSU/CSU
☐ 80. ☐ VSAT/Satellite
☐ 81. ☐ ISDN Equipment & Services
☐ 82. ☐ PBXs
☐ 83. ☐ Voice Mail/Response
☐ 84. ☐ Videoconferencing
☐ 85. ☐ Leased Lines
☐ 86. ☐ Switched Data
☐ 87. ☐ E-mail/On-line Services
☐ 88. ☐ 800/900/MTS Services
☐ 89. ☐ Virtual Networks
☐ 90. ☐ Outsourcing/Systems Integration Services
☐ 91. ☐ Education/Training Services

☐ 92. ☐ None of the above (1-91)

B1 0596

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THE NEWSWEEKLY OF ENTERPRISE NETWORK COMPUTING

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9501

6 What is the total number of LANs, workstations/nodes at this location/ in your organization?

At this location:

	LANs		Workstations/ Nodes
1.	☐	5,000+	☐
2.	☐	1,000 - 4,999	☐
3.	☐	100 - 999	☐
4.	☐	50 - 99	☐
5.	☐	10 - 49	☐
6.	☐	1 - 9	☐

Entire organization:

	LANs		Workstations/ Nodes
1.	☐	5,000+	☐
2.	☐	1,000 - 4,999	☐
3.	☐	100 - 999	☐
4.	☐	50 - 99	☐
5.	☐	10 - 49	☐
6.	☐	1 - 9	☐

7 Check ALL that apply in Columns A and B:

A. The following network platforms are currently installed:
B. The following network platforms are planned for purchase:

A B
☐ 55 ☐ **NETWORK ARCHITECTURES**
☐ 01. ☐ SNA
☐ 02. ☐ DECnet
☐ 03. ☐ TCP/IP
☐ 04. ☐ Novell IPX/SPX
☐ 05. ☐ APPC/APPN/LU 6.2
☐ 06. ☐ NETBIOS
☐ 07. ☐ AppleTalk
☐ 08. ☐ NFS
☐ 09. ☐ Other *(please specify)*_______________

A B
☐ 56 ☐ **NETWORK OPERATING SYSTEM**
☐ 10. ☐ Microsoft (LAN Manager)
☐ 11. ☐ Novell (NetWare 2.X, 3.X)
☐ 12. ☐ Novell (NetWare 4.X)
☐ 13. ☐ Windows NT
☐ 14. ☐ Windows NT/Advanced Server
☐ 15. ☐ LocalTalk (AppleTalk)
☐ 16. ☐ Banyan (VINES)
☐ 17. ☐ IBM (LAN Server)
☐ 18. ☐ IBM (PC LAN Program)
☐ 19. ☐ Artisoft (LANtastic)
☐ 20. ☐ Digital (Pathworks)
☐ 21. ☐ Other *(please specify)*_______________

A B
☐ 57 ☐ **LAN ENVIRONMENT**
☐ 22. ☐ 4M Token Ring
☐ 23. ☐ 16M Token Ring
☐ 24. ☐ Ethernet
☐ 25. ☐ 100M Ethernet
☐ 26. ☐ StarLAN
☐ 27. ☐ FDDI
☐ 28. ☐ LocalTalk
☐ 29. ☐ 10Base-T
☐ 30. ☐ ATM
☐ 31. ☐ Other *(please specify)*_______________

A B
☐ 58 ☐ **COMPUTER OPERATING SYSTEM**
☐ 32. ☐ DOS
☐ 33. ☐ Unix/Xenix/AIX
☐ 34. ☐ OS/2
☐ 35. ☐ OS/2 Warp
☐ 36. ☐ IBM MVS
☐ 37. ☐ IBM VM
☐ 38. ☐ Digital VMS
☐ 39. ☐ Macintosh
☐ 40. ☐ Windows
☐ 41. ☐ Windows 95
☐ 42. ☐ X Window System
☐ 43. ☐ Solaris
☐ 44. ☐ Other *(please specify)*_______________

☐ 45. ☐ None of the above (1-44)

8 For which areas outside of North America do you have purchase influence? (check all that apply)

1. ☐ Europe
2. ☐ Asia
3. ☐ South America
4. ☐ Australia
5. ☐ Middle East
6. ☐ None

9 Do you have or plan to install client/server networks? ☐ Yes ☐ No

10 Which of the following hardware platforms are installed/planned in your company? (check all that apply)

Mainframes	A – Installed	B – Planned
1. IBM	☐	☐
2. Amdahl	☐	☐
3. Cray	☐	☐
4. Hitachi	☐	☐
5. Unisys	☐	☐

Minis	C – Installed	D – Planned
1. IBM	☐	☐
2. Digital	☐	☐
3. Tandem	☐	☐
4. Unisys	☐	☐
5. AT&T GIS	☐	☐
6. HP	☐	☐
7. Data General	☐	☐

Which of the following do you have installed/planned: (USE NUMBERS ONLY)

	At this location:		Entire organization:	
	E – Servers	F – Clients/Nodes	G – Servers	H – Clients/Nodes
1. Power PC				
2. Power Macintosh				
3. Macintosh (Other)				
4. Pentium-based				
5. 80486-based				
6. 80386-based				
7. 80286-based				
8. RISC-based workstations				
9. Other				

11 What is the estimated value of networking equipment and services that you help specify, recommend or approve annually? (check one only)

01. ☐ $100 million or more
02. ☐ $50 million - $99.9 million
03. ☐ $25 million - $49.9 million
04. ☐ $20 million - $24.9 million
05. ☐ $10 million - $19.9 million
06. ☐ $5 million - $9.9 million
07. ☐ $1 million - $4.9 million
08. ☐ $500,000 - $999,999
09. ☐ $250,000 - $499,999
10. ☐ $249,999 or less
11. ☐ None of the above

12 Estimated gross annual revenue of your entire company/institution: (check one only)

1. ☐ $10 billion or more
2. ☐ $1 billion to $9.9 billion
3. ☐ $500 million to $999.9 million
4. ☐ $100 million to $499.9 million
5. ☐ $50 million to $99.9 million
6. ☐ $10 million to $49.9 million
7. ☐ $5 million to $9.9 million
8. ☐ $4.9 million or less
9. ☐ None of the above

13 Estimated number of employees at this location/in entire organization:

At this location:

1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

Entire organization:

1. ☐ Over 10,000
2. ☐ 5,000 - 9,999
3. ☐ 2,500 - 4,999
4. ☐ 1,000 - 2,499
5. ☐ 500 - 999
6. ☐ 499 or less

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Briefs

■ **Unisys Corp.'s Personal Computer Division** *last week announced the Aquanta line of* **Pentium and Pentium Pro-based servers.** *The five models are based on Pentium and Pentium Pro microprocessors of varying speeds up to 200 MHz. The servers are designed for use in everything from branch offices to large LANs.*

The servers include both EISA and PCI buses, and up to 15 EISA and PCI expansion slots, depending on the model. The Aquanta line runs Windows NT, OpenServer, UnixWare, NetWare, NetWare SMP and OS/2 Warp Server. The new line is available this month with prices starting at $3,990.

Unisys: (800) 874-8647.

■ *Cashing in on the recent wave of industry support for the X.500-based* **Lightweight Directory Access Protocol (LDAP),** *London-based* **Data Connection, Ltd.** *has added LDAP support to its DC X500 Directory Server. The product is a standalone X.500 directory server that runs on Windows NT, OS/2, HP-UX and AIX servers and supports all Windows applications.*

It also has support for Lotus Development Corp. Notes, Microsoft Corp. Exchange and Novell, Inc. GroupWise. It can be accessed using Web browsers, X.500 agents, Windows applications or through touch-tone phones using an interactive voice response module. Pricing was not available.

Data Connection: (011) 44-181-366-1177.

■ **NetPro Computing, Inc.** *has announced it will offer users free copies of its DS Expert for NetWare 4.1* **Novell Directory Services** *management utility from May 13 to July 31. A fully functioning and licensed version of the two-server StarterPack, including 90 days of technical support, will be available for download at www.netpro.com/freeoffer. Agents for additional servers cost $499.*

NetPro: (800) 998-5090.

Apple's Amelio positions company for a comeback

By Kristi Essick
San Jose, Calif.

Gilbert Amelio, Apple Computer, Inc.'s new chairman and chief executive officer, last week unveiled his plan to save the shrinking company from demise. The plan includes a 50% cut in the number of Macintosh models manufactured, aggressively licensing the MacOS and shipping Internet-ready machines.

Apple's Amelio *says, "We want to build the Internet right into the MacOS."*

In perhaps the boldest move to bring the company back to life, Amelio said Apple will cut the number of shipping models in half and cut the number of motherboards from nine to five in the next 12 months. This will be followed by a decrease to only two motherboards shortly thereafter. The company's six separate architectures will be consolidated into one version. "I want only one MacOS," Amelio said.

"Our products have become increasingly complex and expensive. Even with the best [operating system], we have failed to win the battle, but Apple has a vision to keep, and we have to get back to work," Amelio said last week to a crowd of 4,000 people at the Apple World Wide Developers Conference here.

Amelio also outlined a three-part plan aimed at developers that he called, "the most important aspect behind making Apple great." The plan calls for implementing a strategy around open connectivity to the Internet and multimedia authoring; creating a new business structure within the company; and resetting the cost structure down to $9 billion.

The company plans to ship all Macintoshes with Internet-ready software — either America Online, Inc.'s or Apple's own Internet Connection Kit — by year-end.

In addition, Apple said the developers' release of Cyberdog 1.0, a suite of Internet software based on OpenDoc technology includes a Web browser, mail reader and File Transfer Protocol client. Cyberdog will be integrated into the MacOS so users can, for example, drag and drop live URLs onto their desktops.

In addition, Amelio said the company is readying its Newton line of personal message systems for Internet access.

Amelio also detailed Apple's new business structure, which is built around three new organizations: AppleSoft, for the company's software applications; AppleNet, to accomplish its Internet strategy; and AppleAssist, a revamped customer support network. Within this structure, Apple will operate four hardware divisions: Information Appliances, Macintosh, Alternative Platforms and Imaging.

Contact Apple at (408) 996-1010.

Essick is an IDG news correspondent in San Mateo, Calif.

MORE ONLINE

Bite into more Apple information on Network World Fusion (http://www.nwfusion.com), including details about:

- **The Cyberdog programming tool kit**
- **The Pippin multimedia platform**
- **Internet-enabled Newtons**

NetworkWorld Fusion

Simware eases NetWare upgrades

By Kevin Fogarty
Ottawa

Simware, Inc. last week began shipping an enhanced version of its tool kit for enabling customers to migrate from Novell, Inc.'s NetWare 3.X to Version 4.1.

Enhancements to the RexxWare Migration Toolkit include the ability to halt a file conversion midstream, then have it take up where it left off later.

The tool kit is designed to help NetWare 3.X users define the steps they need to go through to migrate multiple servers to NetWare 4.1, then automate that process. After converting a series of files and user information, it can automatically assign new NetWare 4.1 users the same rights to those files they had on NetWare 3.X servers. That saves effort for administrators, who would otherwise have to assign rights manually, said Christopher Fedorko, vice president of marketing for Simware.

The tool kit's new ability to let customers stop and restart conversions allows for recovery after power failures and also supports users who realize halfway through a conversion that they forgot to account for some variable. In previous versions of the product, users would have to add the new variable and rerun the conversion process from scratch, Fedorko said. Another feature lets users reverse a migration process and return the network to its previous condition. In addition, the product can be used to migrate new groups to the NetWare 4.1 directory a few at a time.

The tool kit also includes an API that allows sophisticated users to write scripts using RexxWare to customize migrations, adding such features as the ability to match internal phone lists to Novell Directory Services directory entries.

Pricing for the tool kit starts at $795.

©Simware: (613) 727-1779.

Intel makes Fast Ethernet adapter cards adaptive

By Jodi Cohen
Hillsboro, Ore.

Intel Corp. last week unveiled software that lets customers take advantage of new network operating system releases without having to swap out their Fast Ethernet adapter cards.

Using Adaptive Technology microcode, customers can update their Intel PCI EtherExpress PRO/100 adapters so they are optimized to run with a particular network operating system.

"Until now, you couldn't change the adapter's microcode," said Dan Sweeney, business unit manager for infrastructure products at Intel. "So when designing LAN adapters, engineers had to tune one set of microcode to get the best overall performance of several NOSes and LAN environments."

Intel's new software provides reloadable microcode updates that tweak the adapter for maximum throughput and minimum CPU utilization, Sweeney said. For example, Intel's internal testing shows that customers using the Adaptive Technology upgrade can increase throughput by 5% in Novell, Inc. NetWare environments, and by as much as 20% on Microsoft Corp. Windows NT networks, he said.

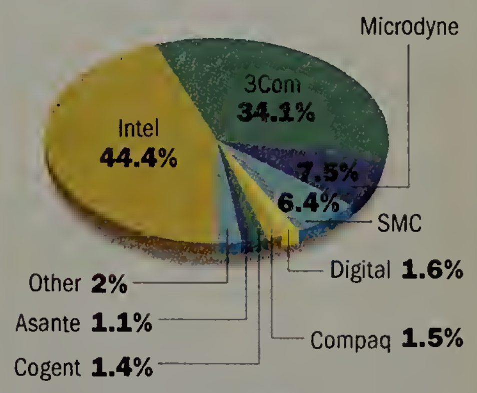
Adaptive Technology also offers customers investment protection, according to Chad Taggard, Intel's Fast Ethernet product line manager.

"The next release of Net-

See **Intel,** *page 35*

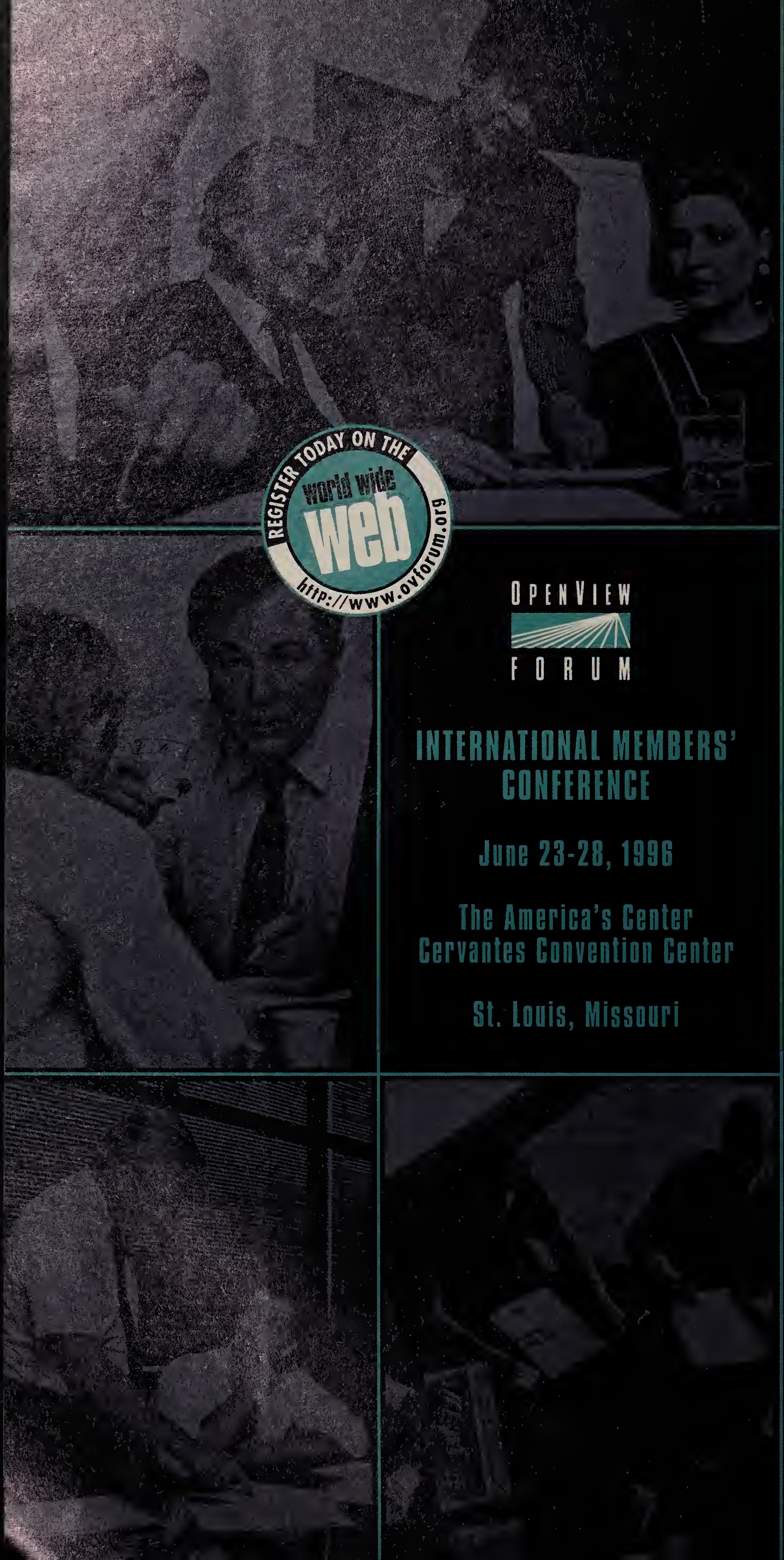
FAST ETHERNET ELITE

Intel sat atop the worldwide 10/100M bit/sec Ethernet adapter market in 1995.



Total shipments: 665,000 adapters

SOURCE: INTERNATIONAL DATA CORP., FRAMINGHAM, MASS.



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Intel

Continued from page 33

Ware, codenamed Green River, wasn't even on the drawing board when our silicon was designed two or three years ago," he said. "Now, when Novell releases it, we will have the ability to make changes in the silicon that will optimize performance."

Most customers do not go to the trouble or expense of swapping out Fast Ethernet adapters to adjust to minor network operating system changes, and as a result, run the risk of suffering network performance problems.

"Intel's approach will help reduce costs by allowing people to upgrade without swapping out hardware," according to Justin Smith, an analyst with International Data Corp., a market research firm in Framingham, Mass.

Intel plans to add capabilities so that the adapter can behave differently depending on whether it is running in a shared or switched environment.

Also, future releases will handle collision reduction and application tuning. These upgrades are scheduled for later this year.

Customers can license and download the Adaptive Technology microcode at no cost via Intel's World-Wide Web site at http://www.intel.com/comm-net/sns.

©Intel: (800) 538-3373.

BusinessBriefs

Plaintree Systems, Inc. last week announced that **Alan Greenfield** will join the company as senior vice president of marketing and sales. Greenfield will be responsible for sales and marketing of Plaintree's WaveSwitch **LAN switches.** Greenfield comes to Plaintree after cofounding LANart Corp. in 1992, an Ethernet LAN connectivity vendor based in Needham, Mass.

Ascom Timeplex, Inc. and **Xylan Corp.** last week announced that they have **settled the lawsuit** filed by Ascom Timeplex in June 1995 regarding the company's virtual LAN patent. The settlement grants the Xylan rights to use certain VLAN technology covered by the Ascom Timeplex patent. The agreement gives Ascom Timeplex limited license to use existing Xylan technology in the company's Synchrony family of frame relay and circuit switching products.

Ethernet switch vendor **Transition Networks, Inc.** last week announced that **Sal Mondelli** has been named the company's new president and chief executive officer. Mondelli joined Transition Networks in 1995 as vice president of sales and marketing. Prior to Transition Networks, Mondelli served in various positions at Prodea Software Corp. and IBM.

WIRED WINDOWS

Don't get too excited about WinNT 4.0

Microsoft Corp. began shipping the second beta release of Windows NT Server 4.0 last week, making it timely to take a close look at the major differences between Versions 3 and 4 of the operating system.

Microsoft calls Version 4 "a refining and extending" of NT Server 3.51, with the addition of the Windows 95 interface, a few wizards to "reduce the number of steps required for a system administrator to install, use and manage a server" and Microsoft's Internet Information Server software. Hardly sounds like a major revision, does it?

Dave Kearns

Once upon a time, the jump from one version to the next meant a significant change, perhaps even a full rewrite. It often meant having to run a conversion program to move data and applications from the older to the newer version.

One good example would be the change from NetWare 3 to NetWare 4 — a total rewrite of the operating system and a total change in the security and management functions.

Microsoft appears to believe that version numbers are taken as some sort of rating by the naive user. Remember when Word for Windows 2.0 was revised. . .as Word for Windows 6.0?

Among the other improvements and features of Windows NT Server 4.0 are Distributed Component Object Model — another name for network OLE, which has been around for a while — and Domain Name Service — actually a wrapper around Microsoft's proprietary Windows Internet Name Service to keep the Unix crowd from screaming louder.

Microsoft is also touting improved performance, claiming NT 4.0 is twice as fast as Version 3.51 when used on a file server. This is accomplished, though, at some risk of Novell, Inc. saying "We told you so."

Many of the drivers that ran in the protected ring 3 in NT Server 3.51 have been pushed into ring 0 in NT 4. This should improve performance, but it means third-party software will be running in the unprotected ring 0, which could increase the possibility of server crashes.

So what it seems we're being offered is NT Server 3.51 with better throughput and a few new applications and services.

Put it all together and it sounds like a good candidate for NT Server 3.6, if not 3.52. But I guess that would leave NetWare 4.1 a half-point better in some strange contest.

Windows NT Server 4.0 deserves your attention, especially if you're already an NT shop. Just don't get the idea that this is a major upgrade.

Kearns, a former network administrator, is a freelance writer and consultant in Austin, Texas. He can be reached at dkearns@msn.com.

Tip of the week

Of the new security products on the market, Win-Secure-It for Windows 95 deserves a look. While Windows NT and NetWare can handle security at the network level, this product offers protection for local disks and files. You can check out an evaluation version on the Web at http://ourworld.compuserve.com/homepages/dascalu.

NET RESULTS

Will no one cry for the token-ring user?

Token-ring customers are feeling left out these days based on what we've been hearing during a recent series of meetings across the U.S.

One token-ring customer at a convention in Cincinnati summed up some of these frustrations best. "Am I looking at moving new installs to Ethernet? You bet I am," he said. "As a token-ring user, I feel the market is indifferent to me. My chief supplier has ATM tunnel vision, and my selection of switches is not even close to where it should be right now."

Skip MacAskill and Melinda Le Baron

Correct on all three counts.

When discussing this market, you have to start with IBM since it is the undisputed king. But that title also comes with responsibilities, and IBM has not shown the leadership we expect.

The company has sent out mixed signals over the last few years. Remember when IBM was advocating the use of 32M bit/sec full-duplex token ring? That initiative soon took a backseat to 100VG-AnyLAN: IBM's new marketing spin was that token ring at 100M bit/sec was the best panacea.

And that approach ended up being even more short-lived than full-duplex token ring, as IBM then embraced 25M bit/sec ATM as the best migration path for its token-ring customers.

But it was IBM's supposed lack of commitment to the token-ring switching market that irked the largest number of users.

At first, when IBM introduced the 8272 token-ring switch, there was much fanfare over the $700-per-port price — at the time more than 50% less than competing products. But as the old adage goes, you get what you pay for. A couple of delivery dates were missed, and when the switch finally came out, it did not support source route bridging.

Another glaring issue with IBM is the fact that it is reselling Bay Networks, Inc.'s C100 device as the high end of its token-ring switch line. How committed to the market can IBM be if it is willing to resell a competitor's product in an area that it should be dominating?

Last week, IBM officials said the company has now changed its 2-year-old position on token ring, and will launch an extensive marketing campaign within the next 30 days in an effort to recapture the market share it has given away. The market has shown IBM that token ring is alive and well, and that users are not likely to jump to 25M bit/sec ATM, the officials said.

Even so, IBM is not the only problem. Users are also concerned about some of the recent moves by IBM's competitors, including chief rival Madge Networks, Inc.

When IBM started shifting its development focus to ATM, it afforded Madge the perfect opportunity to grab even more of the token-ring users that IBM was seemingly leaving behind. Nonetheless, Madge saddled up that 25M bit/sec ATM horse itself and has been riding it hard ever since.

It seems token-ring users are being told en masse that ATM is their only valid migration option, but nothing could be further from the truth. There are some very good token-ring switches out there from the likes of Nashoba Networks, Inc., Bay and potentially 3Com Corp. And FDDI remains a valid technology for those who think ATM is still too risky.

And yes, as the Cincinnati user indicated, Ethernet is also worth a look.

Le Baron is a research director and MacAskill a senior research analyst in Gartner Group, Inc.'s Network Computing Infrastructure group. They can be reached by E-mail at inquiry@gartner.com or by phone at (203) 316-1111.

Users becoming dedicated to NFS servers

NFS-specific servers ensure fast, reliable access to files across a network; market growth aided by 'Net activity.

By Ben Heskett

The National Aeronautics and Space Administration Goddard Space Flight Center in Greenbelt, Md., was working on a data-intensive earth science project and needed fast access to files. Period.

But instead of opting for general-purpose servers based on Intel Corp. processors or a high-powered Reduced Instruction Set Computing-based platform, the flight center anchored its network with servers designed specifically to run Network File System (NFS). Now over 200 end users hang off three Network Appliance, Inc. Model 1400 servers and a couple of Falcon Systems, Inc. FastfilePro machines.

Network Appliance's *Srinivasan says customers want more disk space.*

"With a Unix box, it's hard to keep people from logging in to it and running [all sorts of] things," said Curt Tilmes, a network administrator at Goddard. "It just makes it more reliable when the only thing you do on it is NFS."

The popularity of application-specific servers is on the rise, and NFS has emerged as an early favorite. Vendors are also offering or readying servers designed to run groupware, Internet software and other applications (see related story, this page).

Currently, general-purpose machines from vendors such as IBM, Digital Equipment Corp. and Sun Microsystems, Inc. dominate the installed base of NFS servers. However, application-specific servers from a gang of lesser known vendors are quickly gaining a foothold because of the way they optimize NFS performance.

Network Appliance, for example, announced that its revenue for fiscal 1996 more than tripled from the previous year. And Auspex Systems, Inc. executives have built a $115 million company based on dedicated NFS servers and high-speed network data access.

New entrants such as Invincible Technologies Corp. (ITC) are also trying to grab a piece of the dedicated NFS market, running popular operating systems such as Digital Unix and Windows NT.

The NFS-specific servers differ from typical servers in that they have been optimized for information access and retrieval, and have stripped-down software and a plethora of drive bays for file storage. Fast I/O to and from the network and outside RAID storage is what sets NFS-specific servers apart.

Dedicated NFS servers fill a void for an application that grew threefold between 1991 and 1994 to 8.5 million nodes, according to Dataquest, Inc. of San Jose, Calif.

Sun recently validated the efforts of smaller vendors offering NFS servers by introducing its own line of NFS servers, the Netra nfs 150 (*NW,* May 13, p. 27). Sun is already a big presence in the NFS server market, but previously did not offer a specifically tuned model.

Of course, it was not much of a surprise that Sun would jump into the NFS-specific server market given that it devised the NFS specification and propagated it as an industry standard.

NFS DEFINED

The Network File System (NFS) was originally released in 1985 by Sun Microsystems. It is a standard for file sharing over heterogenous systems, spanning PCs and mainframes. NFS 3.0 includes scalability enhancements, enabling it to be used in a branch office or enterprise network.

NFS is a component of SunSoft, Inc.'s ONC+ information-sharing suite of services. It lets end users share files and access data across networks comprising disparate computers and platforms.

NFS servers are becoming increasingly popular among customers looking to provide end users with fast access to Internet and intranet resources.

ITC, which only recently started shipping its first generation of Lifeline information servers, has already found its way into Netscape Communications Corp.'s famed Web server environment in Silicon Valley.

And Mindspring Enterprises, Inc., a large Internet service provider based in Atlanta, will install three of Network Appliance's new Godzilla F540 NFS servers to handle its news service, home directories and Web-hosting responsibilities, citing one reason alone: speed.

"We just have a real specific application in mind here. We want to get as much I/O as we can off those machines to the file system," said Fred Nixon, vice president of engineering at Mindspring.

Mindspring stores Web pages on the Network Appliance file system, which serves as a back end to a series of general-purpose Sun servers. Those servers act as Web servers, by hosting Web surfer hits. File access times with a Network Appliance machine often equal that of a local disk on a PC, Nixon said.

NFS may become an even more attractive 'Net technology as a result of SunSoft's effort to introduce its Web-NFS specification to standards bodies this summer. The technology would enable Web browsers to access NFS file servers.

Mainly, the companies that are moving to NFS-specific servers are those that do not want to run heavy-use applications such as NFS alongside a database or another application, but instead want to off-load it to a dedicated box, according to Curt Franklin, director of Client/Server Labs in Atlanta, a server testing and benchmark facility. This approach can often be cheaper than moving to a RISC-based mid-range machine, he said.

With top performance in mind, vendors are juicing up their NFS servers. ITC recently increased the storage capacity of its Alpha-based Lifeline series of information storage servers to 295G bytes from 86G bytes. Storage capacity is a key component of NFS servers because a large file system is tempting to rapidly growing companies.

In the same vein, Network Appliance has countered with its own Alpha-based line of servers code-named Godzilla. Customer need for more disk space is pushing Network Appliance to upgrade its product line, according to Cheena Srinivasan, a product line manager.

There are conflicting views on the state of the application-specific server market. Some industry observers say administrators are looking to consolidate networks around larger servers, whereas others believe servers for specific tasks will flourish in distributed networks.

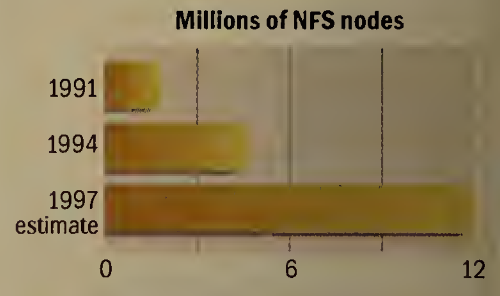
But high throughput will always be attractive. Vendors such as Network Appliance, Auspex and ITC are likely to add database-specific models running NFS as they grow, providing fast access to information in that space, said Robert Spaulding, an analyst with the META Group, Inc. in Stamford, Conn.

"Within a very short time — pushed by increased ability fo data access on a network vis-a-vi the intranet and Internet applications — we'll see these [NFS-specific servers] proliferate wit a relational database back end,' Spaulding predicted.

Emerging technologies ma provide new market opportunites for NFS-specific vendors too. For example, Silicon Graphics, Inc.'s Big Data Service (BDS) adapts the general-purpose fil access capabilities of NFS to specialized file types such as animation or media so that they can b accessed quickly. ■

NFS INSTALLED BASE GROWTH

The market potential for dedicated Network File System (NFS) servers is strong given that the market for NFS nodes running on Unix machines and PCs is on the rise.



SOURCE: DATAQUEST, SAN JOSE, CALIF.

What makes a server app-specific?

Vendors of all shapes and sizes are packaging application bundles with their servers. But a server bundle isn't necessarily the same as a true application-specific server.

Server bundles, such as the Internet packages being offered by Intel Corp.-based vendors, simply involve the pre-installation of Web server software on a standard server for a certain price. These servers could just as easily be configured to run another application.

Application-specific servers, on the other hand, are designed to run only certain applications. For example, though originally designed for data-intensive general use, NetFRAME Systems, Inc.'s machines have been tweaked to run as dedicated messaging servers.

Available are MessageCluster servers for Lotus Development Corp.'s Notes and Novell, Inc.'s GroupWise; support for other messaging applications is on the way.

NetFRAME's optimized I/O subsystem and two-way Gemini symmetric multiprocessing failover technology are good fits for messaging applications.

Another vendor, Mobius Computer Corp. boasts proficiency in Notes servers as well as Internet and intranet applications. Taking NetFRAME's subsystem concept a step further, Mobius servers have processors dedicated to storage and network connections, as well as I/O. Thus, the main CPU can process requests at a much faster rate and, given the floating-point-intensive nature of Notes applications, that can be a substantial benefit.

—Ben Heskett

Client/Server Applications

Covering: Databases • Messaging • Groupware
Conferencing • Imaging • Multimedia • Development

Briefs

■ **PictureTel Corp.** *in Danvers, Mass., last week unveiled PictureTel Live200p, a Windows 95-compatible* **desktop videoconferencing** *product that relies on ISDN and works with the native graphics card of any PCI bus-based PC. Live200p includes LiveWare software, which integrates video- and data conferencing through a single user interface. The product is available now for $1,495.*

Also announced: the Prism line of multipoint videoconferencing servers, starting with a $19,000 model that links as many as four PC users. The server is available this month. A $25,000 option lets users see all conference members onscreen at once.

PictureTel: (508) 762-5000.

■ **Landmark Systems Corp.** *in Vienna, Va., last week began shipping agent software that lets its PerformanceWorks performance management system monitor and report on* **Oracle Corp. databases.** *PerformanceWorks is a set of tools that monitors and analyzes database activities to detect potential problems and identify quickly the exact nature of a fault. In addition to its new SmartAgent for Oracle, Landmark offers agents for operating systems and other software products. The agent starts at $3,750; the monitoring system itself starts at about $10,000.*

Landmark: (703) 902-8000.

■ **Ontos, Inc.** *this month announced* **Onto Object Integration Server 2.0,** *software that lets object-oriented C++ applications work with data stored in relational and flat-file databases. The release, due out in June, will support database-stored procedures and redundant database tables, automatic generation of SQL code and a graphical user interface that is easier to use. Version 2.0 will be released first on Solaris, X Window System Version 11, and Sun Open Window platforms. Pricing starts at under $1,000.*

Ontos: (508) 323-8000.

Open Group tightens distributed net security

By John Cox

Cambridge, Mass.

The nonprofit Open Group last week released two proposed standards for making commercial companies' distributed networks more secure.

These standards are the first pieces of what will be called X/Open Security, a set of security services that will be implemented largely by operating system and application development tool vendors.

Open Group's *Adams*

"The Open Group becomes a vehicle for delivering a set of standards for bringing coherence to the information security picture," said Jean Bozman, research manager for Unix and server operating environments at International Data Corp.'s Mountain View, Calif., office. "But this is not [executable] code. It's up to the vendors to create that."

Today, information security for distributed networks is complicated by two issues: One is that each software vendor delivers a unique security model, so there is little that unites these models and applies them to the special needs of distributed networks. Another issue is that what uniformity exists is based on government security standards, and what the CIA needs for security is, in many instances, much different from what Bank of America needs.

X/Open Security addresses these problems, making practical security for commercial enterprises more cost-effective, according to Dean Adams, manager of security and electronic commerce for The Open Group. The organization was formed by the recent merger of X/Open Company, Ltd. and Open Software Foundation, Inc.,both of which worked to foster industry standards for distributed computing.

The Open Group security specifications are:

■ Baseline Security 96, a common set of security functions that operating system, database and other vendors can incorporate in future releases of their products. These security functions include identification and authentication, system entry tracking, and auditing and access controls.

■ Secure Communications Services, which is based on the Generic Security Service (GSS) API devised by the IETF. The GSS interface specifies several services that securely link software programs on different computers. The GSS API has been introduced in Distributed Computing Environment 1.1 and in some products.

©The Open Group: (617) 621-8700.

Download white papers on X/Open Security specs from Network World Fusion. Select News+ then Client/Server Applications.

NetworkWorld Fusion

Borland snaps up middleware

By Sari Kalin

Scotts Valley, Calif.

Borland International, Inc. last week announced plans to buy Boston-based Open Environment Corp. (OEC) in a stock deal valued at $64 million, a move that should give Borland a boost in client/server and intranet markets.

OEC's Entera product line consists of communications middleware and development tools based on the Open Software Foundation, Inc.'s Distributed Computing Environment (DCE), a set of standard network services for distributed applications.

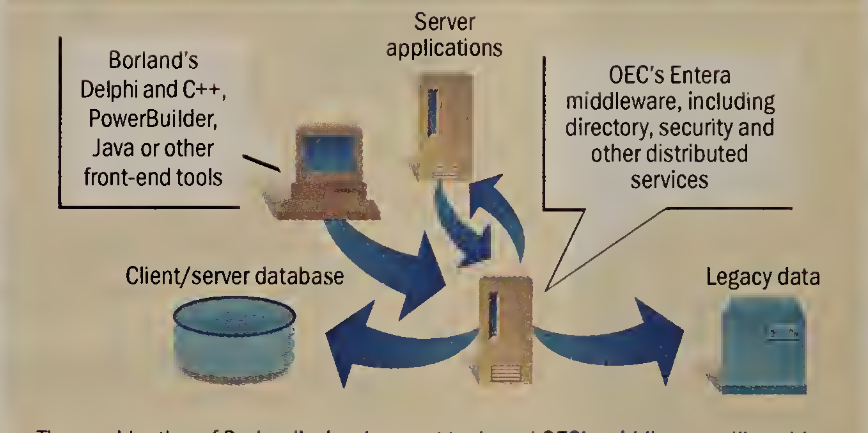
The merger will fill a hole in Borland's client/server strategy, according to one analyst.

"Borland has made very good inroads into the client/server market" with its Delphi client/server application development suite, said Judith Hurwitz of Hurwitz Consulting Group, Inc., in Newton, Mass. "What they didn't have was the infrastructure piece, the middleware."

The agreement is expected to be completed by late July or early August.

Kalin is a correspondent for the IDG News Service Boston bureau.

Borland takes middleware road


Borland's Delphi and C++, PowerBuilder, Java or other front-end tools
Server applications
OEC's Entera middleware, including directory, security and other distributed services
Client/server database
Legacy data

The combination of Borland's development tools and OEC's middleware will enable companies to build applications that can access legacy data and distributed client/server databases.

ViewStar blends workflow with the Web

By Barb Cole

Alameda, Calif.

ViewStar Corp. last week took the wraps off a suite of products for deploying the company's Windows NT-based workflow software on corporate intranets and the Internet.

The three-product suite includes an HTML translator, software for initiating workflow processes on the 'Net and middleware to hook multiple workflow systems together via Internet protocols.

The first two components, InfoServer@Work and Process@Work, may be used together to develop Web-based workflow applications that can access information stored in ViewStar databases as well as legacy systems. Both will run initially on Microsoft Corp.'s Internet Information Server.

InfoServer@Work does the HTML translation between Web browsers and back-end corporate data. Process@Work lets users initiate workflow processes from Web browsers, track the status of work as it moves through a workflow and add information to work in progress.

Internet Transport Task, the suite's other component, is middleware that runs on the ViewStar workflow server and moves work between separate ViewStar systems via Internet transport protocols. The suite is aimed at customers that have embraced workflow and document imaging, and are looking to expand those applications via the 'Net.

"We just implemented [ViewStar] workflow software in our undergraduate admissions office, and the first question our users had was, 'When will people be able to access this application via the Web?'" said Brian Kemerait, director of the Management Information Resource Center at North Carolina State University.

"We anticipate a lot of students looking to fill out admissions forms via the Web," Kemerait said. In addition to expanding the application to would-be students, the new software will let the university broaden its reach to employees that have browsers running on Unix or Macintosh computers — two platforms that ViewStar previously did not support.

InfoServer@Work and Process@Work will be available in the third quarter, and cost $50,000 per server and $30,000 per server, respectively. Internet Transport Task is available now for $2,995.

©ViewStar: (510) 337-2000.

SHARED LOGIC

Marc Myers

Enterprise project mangement — it can be automated

Pop quiz: Computer-based project management is A) a waste of time; B) a necessary evil; C) an absolute necessity; or D) an obsession.

If you answered C or D, then you can skip to the bottom of the article, grab the phone number for Digital Tools and give them a call to learn about the latest and most thorough enterprise project management offering I've come across. If you answered A or B, then read on.

Automated project planning tools are at least a necessary evil for most organizations. But once the project has been defined and the initial timeline created, most managers never get around to using the project planning tool as a data collection device of project actuals.

But the problems created by managing projects autonomously, without an integrated management tool, are that project metrics are never captured, human resources are not tracked and complex interproject dependencies cannot be planned. These effects can be devastating in large organizations where projects may involve several hundred participants scattered across multiple continents.

Consider as an example a project at Sun Microsystems Computer Corp. involving the replacement of a mainframe that currently supports all of the company's business activities with a new Oracle Corp.-based client/server system running on Sun hardware. The project includes 150 to 200 subprojects and over 8,200 defined activities. More than 35 project managers are involved.

How do you manage such an effort?

Most project managers throw up their hands and admit that they have no recourse but to manage by the seat of their pants.

Because this is a real concern of mine — as it is to any manager in a product development environment — I recently did some research for our company to find out what sort of products are designed to handle the problems outlined here.

A tool that stood out was AutoPlan Enterprise from Digital Tools, Inc. in Cupertino, Calif. I received a thorough demonstration of its capabilities and found that it was designed with a great amount of thought on how to solve the problems of enterprise project management. AutoPlan is the product Sun chose to manage its reengineering project.

What impressed me about this tool i the way that dependencies between multiple projects can be visually tracked via graphical user interface, making it possible to quickly view the effects of incoming changes to the original plan. For example, if one expert is being shared among multiple subprojects and is an integra component for those tasks on which he o she is involved, and if that expert suddenl leaves the corporation, the effect companywide can immediately be analyzed s management can move quickly to minimize and repair the damage.

While the subject of project management and control is vast, I will have t leave further discussions to a future column. Suffice it to say that if you are tryin to manage a big project, look into an autc mated project planning and tracking sy tem. I can recommend AutoPlan, but I'n sure there are others on the market tha also deserve your scrutiny.

To contact Digital Tools, visit the con pany's Web site at http//www.digit.cor or call (408) 366-6920.

Myers is president of Client/Server Conne tion, Ltd., a Cambridge, Mass., firm speciali ing in client/server software solutions. He ca be reached at (800) 622-1108, Ext. 522, or v CompuServe at 71332,1726.

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Intranets & the 'Net

Covering: Internet Technologies and Services
for Collaboration and Electronic Commerce

Briefs

Microsoft Corp. *of Redmond, Wash., last week announced an agreement with* **Metrowerks, Inc.** *whereby the Austin, Texas, company will integrate ActiveX technologies with Java in its CodeWarrior line of application development products for the Macintosh operating system.*

Developers can use CodeWarrior products to write Java applets that work with ActiveX controls on the Macintosh.

Microsoft: (800) 426-9400; Metrowerks: (800) 377-5416.

Webster Network Strategies, Inc. *of Naples, Fla., recently announced WebTrack NP for Netscape Communications Corp.'s Proxy Server 2.0. The WebTrack NP software will let corporations* **block access to nonbusiness destinations** *on the World-Wide Web.*

On a weekly basis, Webster updates a control list of URLs in 16 categories, including sex, illegal drugs, online gambling, hate speech, sports, games, entertainment and job search information. Pricing is based on annual subscriptions and will range from $995 to $5,995, depending on the number of users.

Webster: (800) 967-0066.

O'Reilly & Associates, Inc. *has released PolyForm, a* **Web forms construction kit** *priced at $149. PolyForm runs on any Web server using Windows Common Gateway Interface 1.1. A 60-day downloadable version of PolyForm is available at www.ora.com.*

Atlanta-based **Electronic Commerce Systems** *last week unveiled* **The Electronic Catalogue,** *Web software that takes order information and converts it into standard electronic data interchange format. The Electronic Catalogue relies on Netscape Communications Corp.'s Secure Sockets Layer and the encrypted electronic mail Pretty Good Privacy for security.*

Attachmate offers Web window into IBM host

By Carol Sliwa

Users will be able to gain access to IBM corporate databases from Web browsers with the Emissary Host Publishing System unveiled today by Attachmate Corp.

Applications written with the Bellevue, Wash., firm's Quick App and QuickDB can be "Web-deployed" using the Emissary package. QuickApp and QuickDB are both client/server development tools. One integrates host application screen data, and the other queries host databases.

The Emissary approach is straightforward: Developers can take an existing Visual Basic 4.0 application, or start one from scratch, and using QuickApp or QuickDB, enable the forms to grab back-end data from an IBM mainframe.

Attachmate provides an ActiveX control that can be placed on every Visual Basic form containing mainframe data and convert those forms to HTML, said Sandra Peart, senior product manager for Attachmate's client/server products. A property is set on each ActiveX control to tell it to go to the next form, if multiple forms containing host data exist. After the Visual Basic form is converted to HTML, it is passed to the Web server and then to the Web browser, Peart said.

The initial Emissary release is for Visual Basic, but support for other tools, such as Borland International, Inc.'s 32-bit Delphi, C++ and Sybase, Inc.'s PowerBuilder, will follow within three months, said Bobby Clay, Attachmate vice president of client/server products.

"In essence, they're leveraging ActiveX and Microsoft's Visual Basic environment to say, 'Hey, we're not giving you a proprietary environment. We're saying, bring your Visual Basic programmers to bear on this problem and they can use the Visual Basic tools to create any kind of Web screen they want,' " said Tim Sloane, an analyst at Aberdeen Group, Inc. in Boston.

For example, one Attachmate user, the Maryland Department of Labor, has a lot of job information in an IBM mainframe that it needs to make accessible to the public via the Internet.

"One of the things we hoped not to have to do is port applications and data from our mainframe to a different platform in order to make it available on the Internet," said Andy Catts, the technology director who's overseeing Maryland's federally funded initiative to provide one-stop job services. "We're hoping that the Attachmate product will provide us with the mechanism to do that," Catts added.

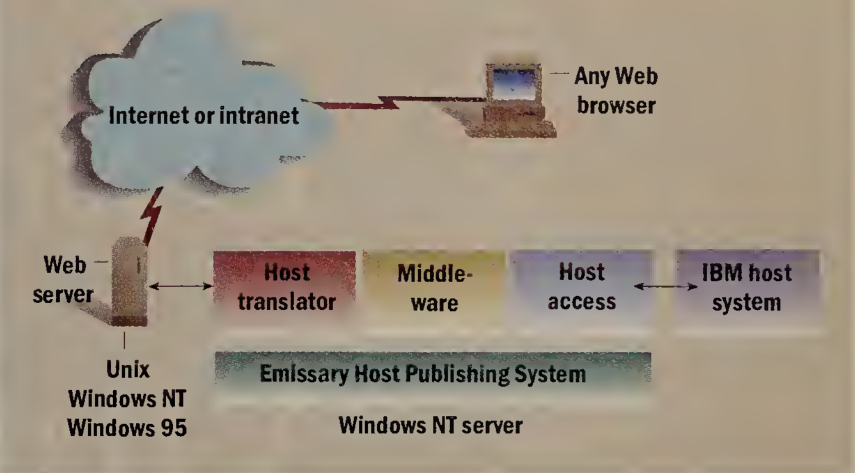
The Emissary software must run on a Windows NT server, but the Web server can be on the same box or on a separate Unix or Windows 95 box. On the client end, the host data can be viewed with any Web browser.

The Emissary system with QuickApp and QuickDB costs $25,000 per server and will be available on May 30 via a special beta program. General availability is expected in about 60 days.

☎Attachmate: (800) 426-6283.

The Emissary Host Publishing System

Attachmate's Windows NT-based software gives users access to IBM mainframe data from their Web browsers.



Call up Network World Fusion and see how other vendors are Web-enabling their apps. Select News+ then Intranets & the 'Net.

Network World Fusion
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Start-up puts security SOCKS on Windows apps

By Ellen Messmer

Campbell, Calif.

Start-up Aventail Corp. has a new way to make Windows applications firewall-ready: Put some SOCKS on them.

Aventail recently announced AutoSOCKS, client software that prepares any Windows-based TCP/IP application for user authentication against a SOCKS-compatible firewall.

AutoSOCKS works with firewalls that support the IETF's SOCKS standard, such as those from Sterling Software, Inc., Harris Corp. and Digital Equipment Corp. With AutoSOCKS, these firewalls can check the identity of the user related to the data before it is allowed to traverse the network firewall.

How it all works

Firewalls are built with so-called proxies for File Transfer Protocol and Simple Mail Transfer Protocol, which permit or block users from sending or receiving files or Internet mail. SOCKS, a generic firewall proxy (now up to Version 4) developed by engineer David Koblis, can handle Windows applications, too.

But if a firm's customized client/server Windows application did not have SOCKS software built into it initially, it would be hard to add it later when the company decides to run it over a network and through a firewall.

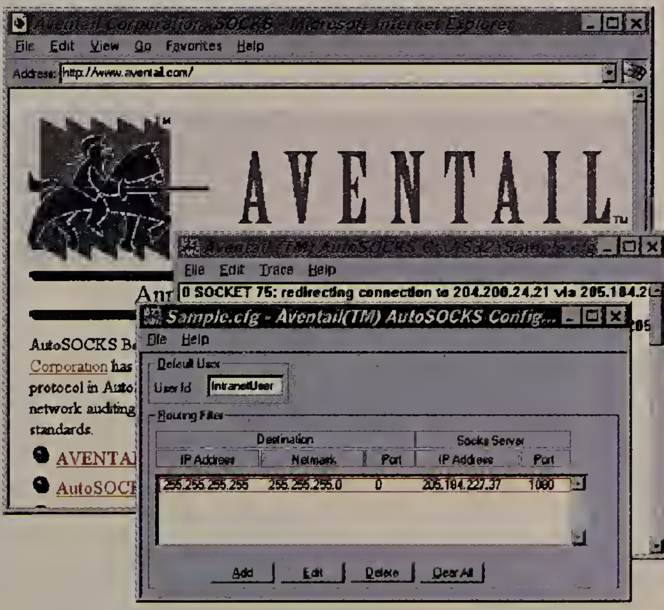
Enter Aventail. Founded by the same Stardust Technologies, Inc. team that developed the WinSock API, the company has come out with an agent for the desktop that "SOCK-ifies" Windows applications, according to Evan Kaplan, president of Aventail . "On the fly, AutoSOCKS takes an application and makes it SOCKS Version 4 compliant," Kaplan said.

With SOCKS, the identity of the application user can be authenticated through security mechanisms such as passwords, Kerberos and encryption algorithms.

IETF tries SOCKS on

Within the next few months, the IETF will be set to approve SOCKS Version 5 as RFC 2928, which will add encryption and support for the TCP/IP sessionless Universal Datagram Protocol, Kaplan said. Aventail plans to update AutoSOCKS to SOCKS Version 5 once it is finalized by the IETF.

☎Aventail: (408) 879-8093.



Address: http://www.aventail.com/

AutoSOCKS B
Corporation has
protocol in Auto
network auditing
standards.

0 SOCKET 75: redirecting connection to 204.200.24.21 via 205.184.2

Sample.cfg - Aventail(TM) AutoSOCKS Config...

Default User
User Id: IntranetUser

Routing Files

Destination			Socks Server	
IP Address	Netmask	Port	IP Address	Port
255.255.255.255	255.255.255.0	0	205.184.227.37	1080

AutoSOCKS configures custom Windows apps for today's firewalls.

FRAME RELAY ENABLING COST-EFFICIENT TRANSMISSION OF DATA FILES
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DATA.
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LAN INTERCONNECT SERVICES
data received
shipping at
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pdate connect
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Technology Update

Keeping Up with Network Technologies and Standards

NETWORK HELP DESK

Network World *tracks down answers to your questions. Please submit them to Chris Nerney via phone at (800) 622-1108, Ext. 451, the Internet at cnerney@nww.com or fax at (508) 820-1103.*

I have been stumped by a development in memory technology. I was recently asked, "What is EDO memory?" and "Can you mix standard RAM modules with it?" Also, could you tell me what advantages EDO provides over standard PC memory?

Scott Hull, U.S. Army, Europe

EDO, or extended-data-out, memory is now standard fare on most high-end Pentium computers. It is designed to keep data available to the processor for an extended period of time, according to an article called "Navigating the Memory Maze" that can be found on Gateway 2000, Inc.'s Web site (http://www.gw2k.com/articles/edomem/edomemry.htm).

Unlike its predecessor — fast page-mode (FPM) memory, which throws away data after reading it — EDO holds the last data request in its buffer while simultaneously reading the next request.

This data-holding technique can increase system performance by allowing the bus speed to reach 50 MHz to 66 MHz, the average speed of a Pentium memory bus. Comparatively, the average FPM memory can only reach a maximum of around 33 MHz.

EDO is designed to work with most PC controllers. In addition, several existing motherboard configurations can handle a combination of EDO and conventional FPM memory, just not in the same bank, the article says.

It's important to note that EDO works in tandem with another kind of memory: cache or static random-access memory (SRAM). The cache is a small amount of memory used for holding data regularly accessed by the processor. It increases overall performance and comes standard on nearly all PCs, the article explains.

Without SRAM, the article cautions, EDO memory will only perform at a level that about equals the FPM/cache combination. A standard EDO/cache combination will operate around 15% faster than a system with EDO and no cache.

Document conferencing made easy

By Joe Sullivan

The inability to access and share PC-resident information in a real-time group setting has proven to be a major weakness of desktop computers. But document conferencing provides the missing link that lets people conduct truly interactive PC-based meetings from remote locations over simple telephone lines.

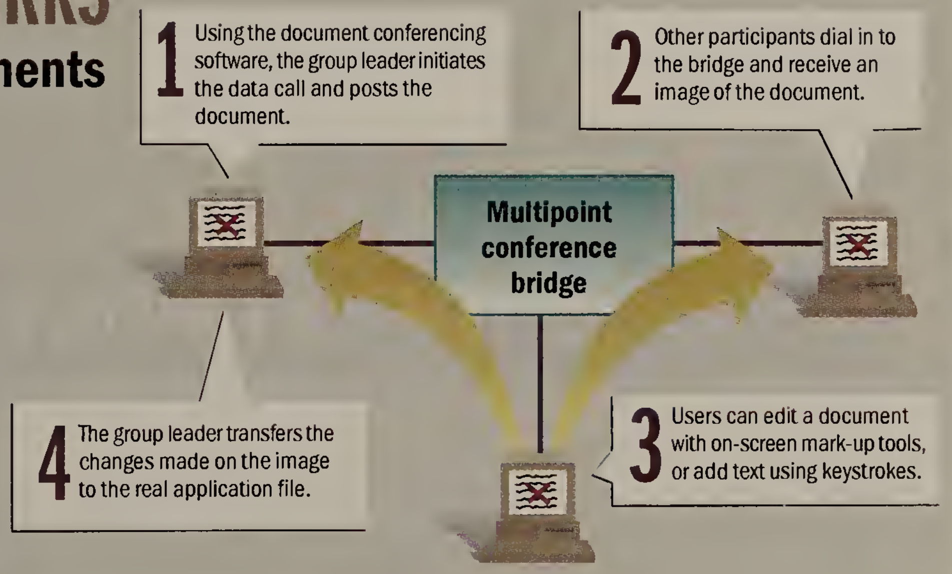
Document conferencing is a logical step beyond what users have been doing at their desks for years: discussing and disseminating information over the telephone and via fax. It replaces the hard-copy approach with an electronic format that permits a much higher level of interaction.

With this technology, any document — a design drawing, spreadsheet, advertising concept, presentation slide or even just a regular word-processing file, for example — can be shared and worked on interactively. What's more, it is relatively simple to implement.

HOW IT WORKS

Sharing documents electronically

Document conferencing software lets teams share and edit files across a network. Conference participants can mark up, save and print the documents on which they are collaborating.



1 Using the document conferencing software, the group leader initiates the data call and posts the document.

2 Other participants dial in to the bridge and receive an image of the document.

3 Users can edit a document with on-screen mark-up tools, or add text using keystrokes.

4 The group leader transfers the changes made on the image to the real application file.

Getting started

Many PC users already have the computer hardware and network connections needed to participate in document conferences. All they need is document conferencing software, which costs between $99 and $150. Basic user requirements include:

- ■ A 486 PC with at least 8M bytes of RAM and hard disk space.
- ■ A modem that operates at 14.4K bit/sec or faster.
- ■ A Microsoft Corp. Windows operating system. Packages are in the works for Apple Computer, Inc.'s MacOS, but none are available yet.
- ■ A regular telephone or a speakerphone.
- ■ Two phone lines — one for the phone itself and one for the modem. (Most document conferencing packages do not yet support ISDN.)
- ■ Document conferencing software such as DataBeam Corp.'s FarSite or Intel Corp.'s Proshare.

The software should comply with the T.120 document conferencing standard ratified by the International Telecommunication Union. Otherwise, each participant needs the same document conferencing software.

Meetings and more

Group collaboration is enhanced when conference participants can see, mark up and edit the document at hand — almost as if gathered around a computer in the same room. Actually, when a number of users are at one site, a company could use a room system that allows multiple groups of people to observe and work together on documents.

Companies have already found a number of ways to enhance business through document conferencing.

For example, an international sales department holds a regular Monday morning conference call to review objectives and performance, discuss key accounts and map strategies for the coming week. Rather than sending packages overnight or playing the fax game 30 minutes before the meeting, the sales managers simply pull up documents from their PCs and present them to the other participants in real time.

Participants can edit the documents or make notations using their mice and drawing tools, or by typing in the changes from their keyboard. The changes can be saved on everyone's computer hard drives or printed, eliminating the need for follow-up mailings or faxes.

Bringing it together

Document conferencing between two parties is quite simple: a point-to-point network connection links the two sites and the conference gets under way. Interaction among three or more parties requires a multipoint bridging capability. Many companies rely on a teleconferencing service bureau to provide this multipoint document conferencing capability since standards-based multipoint conferencing bridges are only now starting to appear.

To conduct a multipoint document conference using a teleconferencing service provider, conference leaders need to call and reserve dates and times for the conferences. The provider will give out the appropriate telephone and modem numbers, which the conference leaders then need to distribute to other participants.

At the date and time of the call, each participant dials the preassigned conference telephone numbers to establish the voice and data connections. When all participants are connected, the conference call begins. When the conference is over, participants simply hang up the phone and disconnect the modem line.

The cost factor

Document conferencing is surprisingly affordable, especially if you compare it to the cost of in-person gatherings.

Let's say you want to meet with six engineers to go over a network upgrade plan via a document conference call. For each participant, it will cost about 85 cents per minute to dial in to the conference via an 800 number from the service provider. If the call lasts one hour, the total cost could be $357 — far less expensive than flying people to meet in one city, and more efficient than reviewing faxed copies and working on the plan via an audioconference call only.

Sullivan is director of multimedia teleconferencing at ConferTech International, Inc., a leading provider of multimedia conferencing services and systems in Denver. He can be reached at (303) 633-3420 or at joe.sullivan@cfer.com.

ON LINE

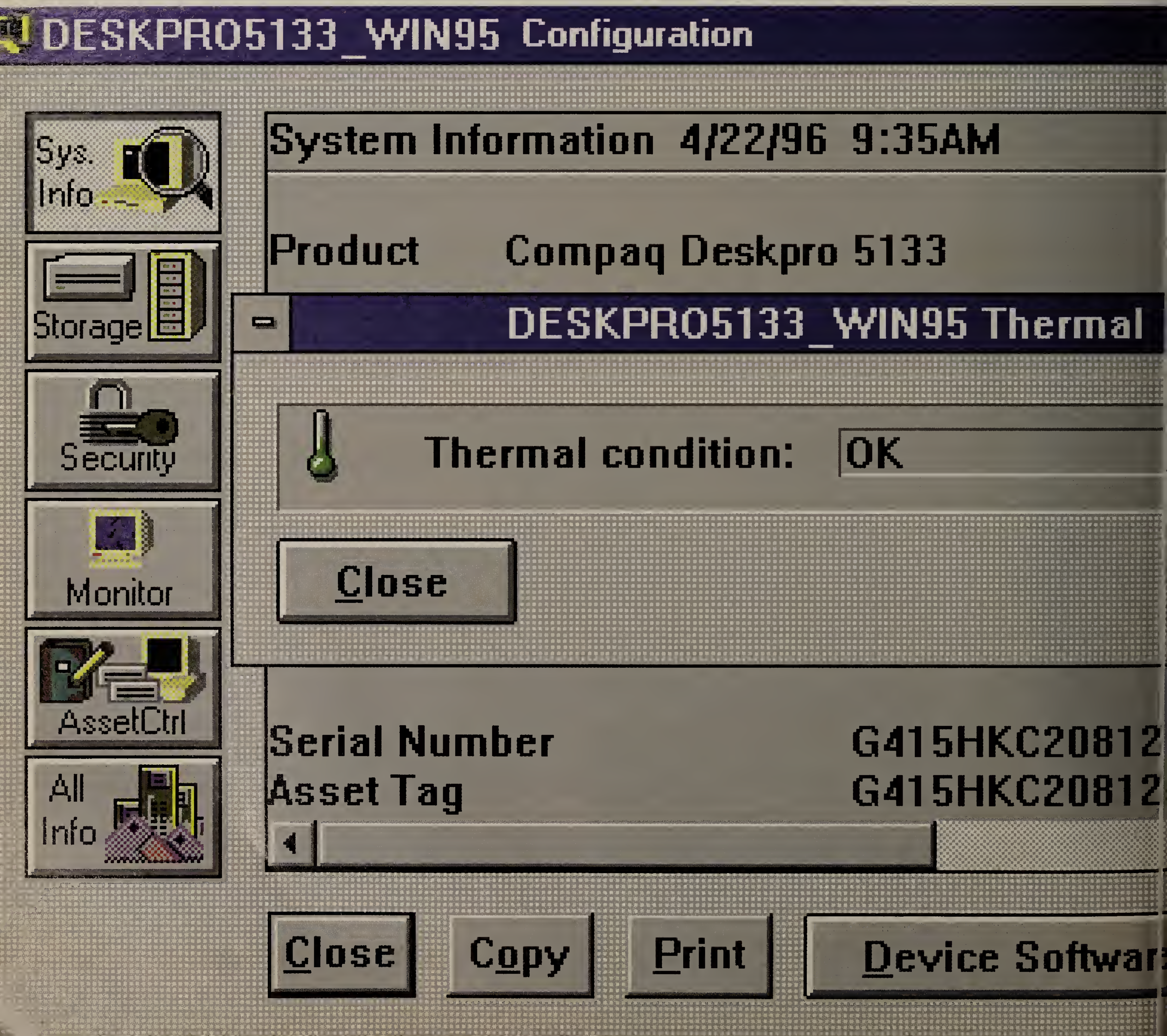
There's more information about document conferencing on Network World Fusion. Select NetRef, Technology Resources then Groupware/workflow.

http://www.nwfusion.com

Need information?

Let *Network World* provide a quick primer on an important or emerging technology. If you have an idea for Technology Update, contact Beth Schultz by phone at (312) 283-0213 or via the Internet at bschultz@nww.com.

A Lot Of Computers Claim To Be The Best. This One Sends You Its Health Records To Prove It.



DESKPRO5133_WIN95 Configuration

System Information 4/22/96 9:35AM

Product Compaq Deskpro 5133

DESKPRO5133_WIN95 Thermal

Thermal condition: OK

Serial Number G415HKC20812

Asset Tag G415HKC20812

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EDITORIAL INSIGHTS

Cheers and challenges

From the "credit where credit is due" department, kudos go out this week to Cabletron Systems, Inc., Hewlett-Packard Co., IBM and SunSoft, Inc. for their efforts in bringing you distributed network management tools.

To be sure, there have been fits and starts in this process — most notably HP's delays in bringing out Tornado, the distributed version of the OpenView Network Node Manager.

But these four vendors — the cream of the enterprise network management crop — have persevered. They've heard your pleas and have — or soon will — delivered versions of their management platforms that can help you keep track of your networks even as they grow ever larger. For that, they deserve credit.

OK, that's enough of that.

As the test results we present this week detail, the job is far from over (see story, page 46).

Ease of use is one issue that still needs attention. Whether it be dealing with the programming necessary to customize HP's OpenView or defining node types to Cabletron's Spectrum, each system has some tasks that are a chore to complete.

As I recently heard a user point out, such complexity implies that a small group of people will have to be highly trained on the product, and that kind of specialization will hurt your organization as a whole.

Databases are another sore point. Spectrum is the only system that comes with an integral DBMS, albeit one without all the features you might be used to from the market leaders. IBM and HP support at least a couple of leading relational DBMSs, but warn that performance may suffer if you use them instead of a flat file database. SunSoft supports only flat file databases, sacrificing the data storage flexibility and reporting features that a relational DBMS provides.

And your choice of hardware and operating system platform is fairly limited in most cases. Reliable Windows NT versions, for instance, have yet to surface.

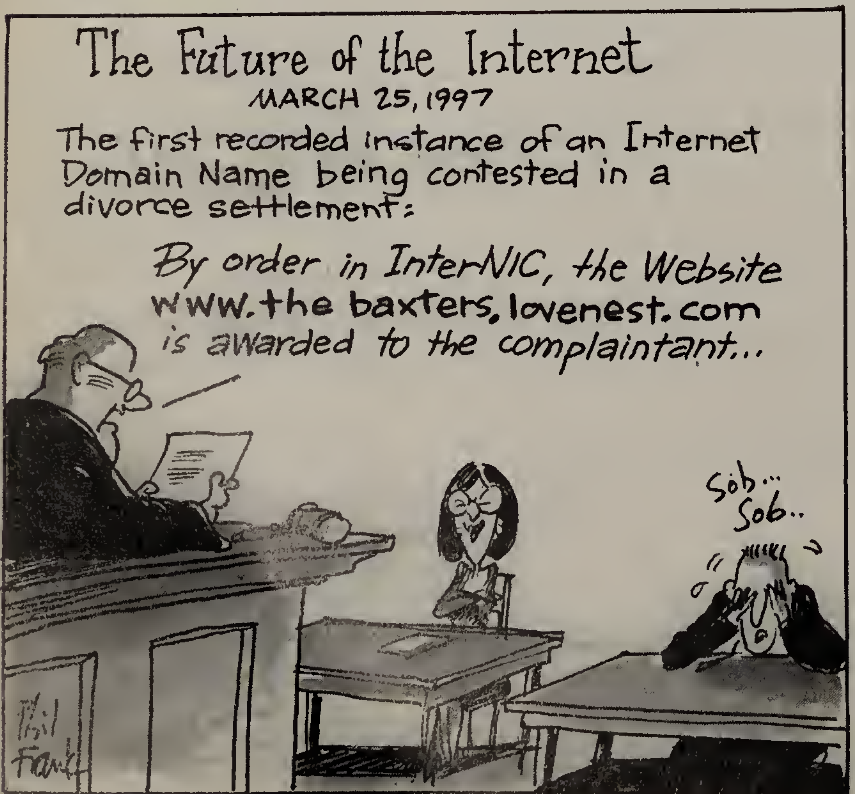
Still, all four vendors have made great strides toward solving the scalability problems inherent in managing a distributed enterprise net. One vendor that is conspicuous by its absence, by the way, is Digital Equipment Corp., which declined to participate in our tests.

That decision speaks for itself.

Paul Desmond, features editor pdesmond@nww.com

Teletoons

By Phil Frank and Joe Troise
guru@well.com


The Future of the Internet
MARCH 25, 1997
The first recorded instance of an Internet Domain Name being contested in a divorce settlement:
By order in InterNIC, the Website www.the baxters.lovenest.com is awarded to the complaintant...
Sob... Sob..
Phil Frank

ABOVE THE CLOUD

Market forces alone can't govern the brave new world of telecom

James Kobielus

The Federal Communications Commission — which just last fall seemed on the brink of Republican-engineered extinction — has secured a powerful new lease on life. It is instituting a regulatory structure for the next 50 years in which it will have broad authority (now that Judge Greene is out of the picture) to set the timetable and terms for the emergence of the new generation of supercarriers.

Those who believe a radically deregulated telecommunications industry — governed solely by market forces — can take hold anytime soon are kidding themselves. Unfortunately, even FCC Chairman Reed Hundt seems to be under the illusion that market forces soon can be let loose to regulate rates for telecommunications services (*NW*, April 29, page 110).

Brace yourself for a rough ride in this hypercompetitive new telecommunications industry. We are in the midst of a regulatory and market free-for-all.

Notwithstanding all the new competition, most telephone companies and cable television companies will retain more than 90% of the subscribers in their traditional markets over the coming decade. If regulators fall asleep at the wheel, these powerful incumbents will have every incentive to leverage their local, near-monopoly installed bases to support new ventures in unregulated market segments.

Indeed, the recent SBC Communications, Inc./Pacific Telesis Group and Bell Atlantic Corp./NYNEX Corp. mergers show that the regional Bell operating companies are eager to remonopolize to head off local exchange competition from one another as well as competitive access providers, cable TV operators and utility companies. The need for a strong, vigilant FCC is more acute than ever. At present, however, the FCC is chronically overworked and underfunded, making it unlikely that the commission will be able to hold to its published timetable of having most new regulations in place by the end of 1997. More likely, appeals of the FCC's decisions will keep the regulatory arena in turmoil well into the next decade.

Brace yourself for a rough ride in this hypercompetitive new telecommunications industry. We are in the midst of a regulatory and market free-for-all. Anybody who's been in the industry for a decade or so probably feels a touch of deja vu. It seems we're back, temporarily, to the heady days of the mid-'80s, when the real money to be made was in lobbying, lawyering and high-stakes deal-making.

Over the next few years, confusion will reign as scores of carriers enter the market. Most will bleed red ink until the inevitable industry shakeout, expected by the year 2000. Mergers, acquisitions and strategic alliances will come fast and furious as carriers grope for the right teaming arrangement. And the transitional nature of much federal and state regulation during this period will add to the climate of heightened risk and uncertainty.

The ground rules of the new telecommunications order will be determined by the extent to which the RBOCs let other carriers access basic facilities in their local exchange networks. Under the new law, they will have to comply with a 14-point checklist of network-access measures in order to be allowed to provide long-distance services.

One could argue that RBOCs have an interest in delaying compliance, so as to strengthen their hold on the local exchange market or at least hamper new local exchange carriers' ability to make competitive inroads.

Local network access and nondiscriminatory pricing are critical issues for the companies that want to compete head-on with the RBOCs. No new local exchange service provider expects to compete and survive against incumbent telephone companies without broad access to the existing Public Switched Telephone Network (PSTN).

You should let the FCC and the RBOCs know that you will not tolerate foot-dragging on the road to an open public network. You should also make your views known to your state public utility commission, since the PUCs are primarily responsible for certifying RBOC compliance with the 14-point checklist. It's in your best interest to see cost-effective local exchange competition as soon as is practical.

Unbundling the public network is no mean technical and administrative feat. However, the RBOCs have been studying it and developing plans almost since the day they themselves were unbundled from mothership AT&T. It's time for them to publish their network-opening implementation schedule for all to see. Better yet, it's time for them to put their money where their plans are and negotiate the terms of network unbundling in binding contracts with competing service providers.

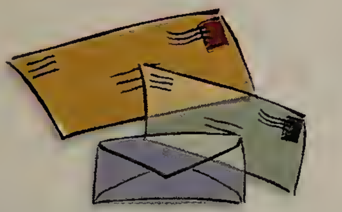
The FCC should ensure that the terms of open network access are reasonably consistent nationwide across all telephone companies. A fully competitive national telecommunications market will depend on standards for interconnection, service definition, numbering, billing and other matters.

Let your congressional representatives know that the FCC's long-term authority must be reaffirmed and appropriations raised to adequate levels in order to carry out the full mandate of the Telecommunications Act of 1996. One suspects that the current Republican leadership is keeping the FCC on a starvation diet and will jump at the chance to decommission the agency once the current wave of rule-makings has subsided.

The PSTN's design, management and control are too important to be left solely to telephone companies — or to the whims of an ideologically blinkered congressional clique.

Kobielus, a contributing editor to Network World, is a senior telecommunications analyst with LCC, L.L.C., an Arlington, Va.-based network design and engineering firm. He can be reached at (703) 807-5075 or at kobielus_james@lccinc.com. The opinions expressed are his own.

MESSAGE



QUEUE

Not worth the wait

Regarding your article "Microsoft shifts gears, but Cairo still no closer" (April 8, page 1):

After years of hearing Microsoft Corp. claim how great Cairo will be, they now say that the ever-vaunted object file system will allow you to add attributes to a file that tell you who created the file and then do searches for that information. Gee, that sounds like OS/2 technology from 1992.

The combination of the OS/2 WorkPlace shell and High Performance File System (HPFS) provides this capability through extended attributes, and HPFS has been available on Windows NT for years. So now Microsoft wants to take it out of NT and create some new file system to do the job. Sounds like a waste of time and money.

To be fair, HPFS does have a major fault: long check-disk times. But that's only a problem if a power failure or system crash occurs. But NT is so robust that would never happen, right?

Anil Maliyekkel
Electrical engineering student
William Marsh Rice University
Houston

FaxPress' real strength

Regarding your review comparing Cheyenne Software, Inc.'s FAXserve and Castelle's FaxPress (April 15, page 43):

I know you were comparing the NetWare Loadable Module (NLM) versions of the software, but that is not the true strength of the Castelle product. Its strength is the FaxPress plug-and-play hardware.

We have been using the FaxPress 2000 for more than two years, and I have been extremely happy with it. At its present 3.5X version, I can connect the FaxPress 2000 to multiple servers; I don't have to be logged on to a specific server. In addition, the product has optical character recognition (twain) compatibilities, and with its new Red Rock release software, will be able to interface with Novell, Inc.'s GroupWise.

The FaxPress NLM does have its problems, and I wish Castelle had not given it the same name as the plug-and-play unit. I hope readers can discern between the two. I feel the difference could have been made clearer in your article.

Richard Freeman
Computer/network specialist
ADP Program
National Museum of Natural History
Smithsonian Institute
Washington, D.C.

Sour note

I agree with your editorial on the dubious value of keynotes (April 15, page 38).

I stopped attending keynotes about three or four years ago when they became nothing more than marketing spiels delivered, in many cases, by unqualified or unprepared speakers.

Maybe someday I will again attend keynote sessions, but not until something of substance or value comes from them.

Jonathan Duke
Executive director
Boston Computer Society
Macintosh Users Group
Cambridge, Mass.

Your editorial on keynotes was on target. It certainly applied to the Association for Information and Image Management (AIIM) '96 show held last month in Chicago. Keynotes were given on April 1 and again on April 3.

First up on April 1 was Wang Laboratories, Inc.'s "vice president of New Jersey." (Wang bought Sigma Imaging Systems, Inc., based in New Jersey — hence, the title.) His role was to tell us who the actual keynote speakers would be. He made no mention of the industry and where it might be going, nor did any of the rest in the April 1 keynote charade.

The next speaker was Joe Tucci, Wang's chief executive officer. His main job was to introduce the real keynote speaker — Paul Maritz, group vice president of Microsoft Corp.'s platforms group. Did I neglect to mention Microsoft provided a $95 million infusion when Wang really needed it and, in return, got Wang imaging software to put into the second version of Windows 95?

Maritz's keynote job was the same as Bill Gates' at NetWorld+Interop 96 in Las Vegas: pitch Exchange, using a backdrop of slides showing every shrink-wrapped package that Microsoft sells.

On April 3, the keynote speaker was Mike Zisman, CEO of Lotus Development Corp. His speechwriter has promised to send me a copy of his talk. I hope Mike was able to stick to his planned speech — the hand of Microsoft seemed to touch every element of the schedule.

Frank Dailey
Principal
Image Technology & Application
Wilbraham, Mass.

Hit parade

Daniel Briere and Christine Heckart's column on what it costs to build a World-Wide Web home page (April 22, page 26) is well taken. I was happy to see someone discussing Web site traffic considerations.

In fact, the authors' calculations were quite generous. It is a very popular Web site indeed that would receive hits at maximum throughput for 24 hours per day. More likely, the traffic would be concentrated over a portion of the day, perhaps as little as six to eight hours if the site is primarily of regional (or even domestic) interest only.

In their scenario involving a 3M-byte video clip and a 56K bit/sec link, the authors calculate that the link could support about seven hits per hour. That could equate to as little as about 40 to 60 hits per day concentrated in a six- to eight-hour period.

Joe Keilin
Account planner
Bell Communications Research
Piscataway, N.J.

Stop kicking free stacks

In the article "Kicking the tires of TCP/IP" (April 22, page 48) by Dave Kearns, I found Figure 2, which depicts which vendors support which IP services and applications, misleading to the point of being simply wrong — especially regarding the Microsoft Corp. free stack.

For example, I'm sure many NT users will be surprised to find that the included stack does not support PING or trace route. And my wife's Windows 95 system probably will stop communicating with my NT machine when it finds out Windows 95 doesn't include a Microsoft Corp. free stack. The figure's omission of Windows for Workgroups is also significant since a free stack is available for it, as well. Even some semitrue aspects of the figure, such as the Microsoft free stack's lack of support for both a DNS client and server, lead readers to conclude that the stack does not support DNS at all.

Linwood Ferguson
Manager of software engineering
Aramark Magazine & Book Services
Louisa, Va.

Kearns replies: Note that the column "Microsoft free stack" in Figure 2 covers Windows for Workgroups, Windows 95 and Windows NT. While the NT stack comes with more functionality than the other two, the chart listed only those services included in all three products. Regarding free vs. for-fee stacks, I've no ax to grind with either way.

Killer virus

Regarding Dave Buerger's column on viruses (April 22, page 65):

The biggest problem with viruses like Concept is that most antivirus software is designed to remove the virus from the code of a .EXE, .COM, .OVL or .DLL file, not a program-specific data file.

Think of the time and effort it takes to create and update an antivirus package that can open and understand the file structure of all of the versions of, say, Word and WordPerfect. Then add to that the need for the antivirus package to be able to open and understand applications such as spreadsheets and graphics files, as well. What a waste of resources, man hours and money just to prevent something that should never have happened in the first place.

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DIVIDE AND CONQUER

DISTRIBUTED NETWORK MANAGEMENT

Attacking distributed network management

BY EDWIN MIER

The following directive was issued a few years ago to a consulting team by the network manager of a large food and retail chain based in the Midwest: "I want to see the status of all my nodes, everywhere, in real time, on one screen."

The consultants huddled, and then replied, "What you want will take the biggest Unix computer built, a doubling of your WAN backbone bandwidth and, to display all 8,500 nodes in your 145 locations, a screen the size of a highway billboard. Shouldn't cost more than a few million, though."

That project never got off the ground.

But a lot has happened since then. Today, a number of large organizations have deployed network managment systems that watch over 10,000 nodes — in some cases many more — and in real time. They can view the current status of any node via a single console. What's more, the network management traffic carried over these organizations' WAN backbones typically amounts to only a few percent of the total traffic.

How did they do it? In almost all cases it was accomplished using a distributed management system, often the result of years of in-house software development. That's because few commercial products were available that addressed this high-end of the net management market.

Last year, however, products from leading network management systems vendors, based on imaginative new distributed architectures, began shipping.

These new packages should properly be viewed as tools, however, and not as plug-and-play products. As with any tool, it is still up to the user, or network management specialists engaged by the user, to prepare the blueprints and build the structure that is needed — a process that takes months.

The characteristics and

capabilities of today's commercial products vary in many respects. However, based on what they have in common, it is safe to say that distributed network management is an infrastructure in which multiple, strategically deployed management stations collaborate to provide coordinated, accurate and timely information on the status and behavior of the network.

Scalability

What does a distributed architecture provide that a centralized approach cannot? In a word: scalability. Users with burgeoning network topologies are increasingly discovering that a single management station simply cannot handle the load alone.

There are several dimensions to scalability in this environment, including:

- Reducing the bandwidth required for management traffic. With a single, centralized management station, every polling message has to travel the full distance from the manager to each managed device and back again. Scalability here means the ability to adjust the flow and volume of management traffic so that high-bandwidth links, such as LANs, carry most of it and less is sent over limited-bandwidth facilities, such as the WAN backbone.
- Improving availability of management data, by providing more flexibility in where it is stored and how it is accessed. In a centralized model, all management data is typically retained on the same central station, which can create a bottleneck. Scalability in this regard means the ability to selectively replicate and synchronize management data over multiple distributed stations.
- Avoiding the processing and memory limitations of a single, centralized management station.

Getting there from here

Where do you start? Well, there are five key stepping-stones to building a distributed management infrastructure:

- Determine the type of management data you need.
- Assess traffic and bandwidth considerations.
- Determine how best to view management data.
- Position data repositories.
- Assess product options.

A big part of determining the type of management data you need is finding out what you do not need and disabling the management processes that produce it. For example, a large manufacturing organization recently investigated the management processes that were generating traffic over its global backbone, and identified over 20 different management protocols, ranging from Digital's Management and Operations Protocol to IBM SNA-based alerts. It turned out that more than half were used by management processes that have long since been discontinued or replaced.

Even in the relatively new world of Simple Network Management Protocol management, there may be excessive traffic-generating activities. It is only recently that vendors of SNMP-managed equipment began shipping their agents such that they do not start issuing traps by default. Traps are one-way notification messages generated by managed devices when certain predefined conditions arise. Previously, it was not uncommon for organizations to have their networks swamped — and their SNMP management station crash — due to a deluge of indecipherable traps regularly issued by some vendors' SNMP-managed device agents.

The same is true for SNMP-based management systems. Most leading vendors now ship their systems with the most egregious traffic-polling processes, such as network discovery and status polling, turned off by default. Previously, this was not the case, and customers often wouldn't know for weeks or months just how much traffic this was causing on a continual basis, or that they could easily regulate it.

FIVE KEYS TO DISTRIBUTED NETWORK MANAGEMENT

1. **Determine** type(s) of management data needed.
2. **Assess** traffic/bandwidth considerations.
3. **Determine** how best to view management data.
4. **Position** data repositories in strategic locations.
5. **Assess** products; decide whether to buy or build (out of the box vs. roll your own).

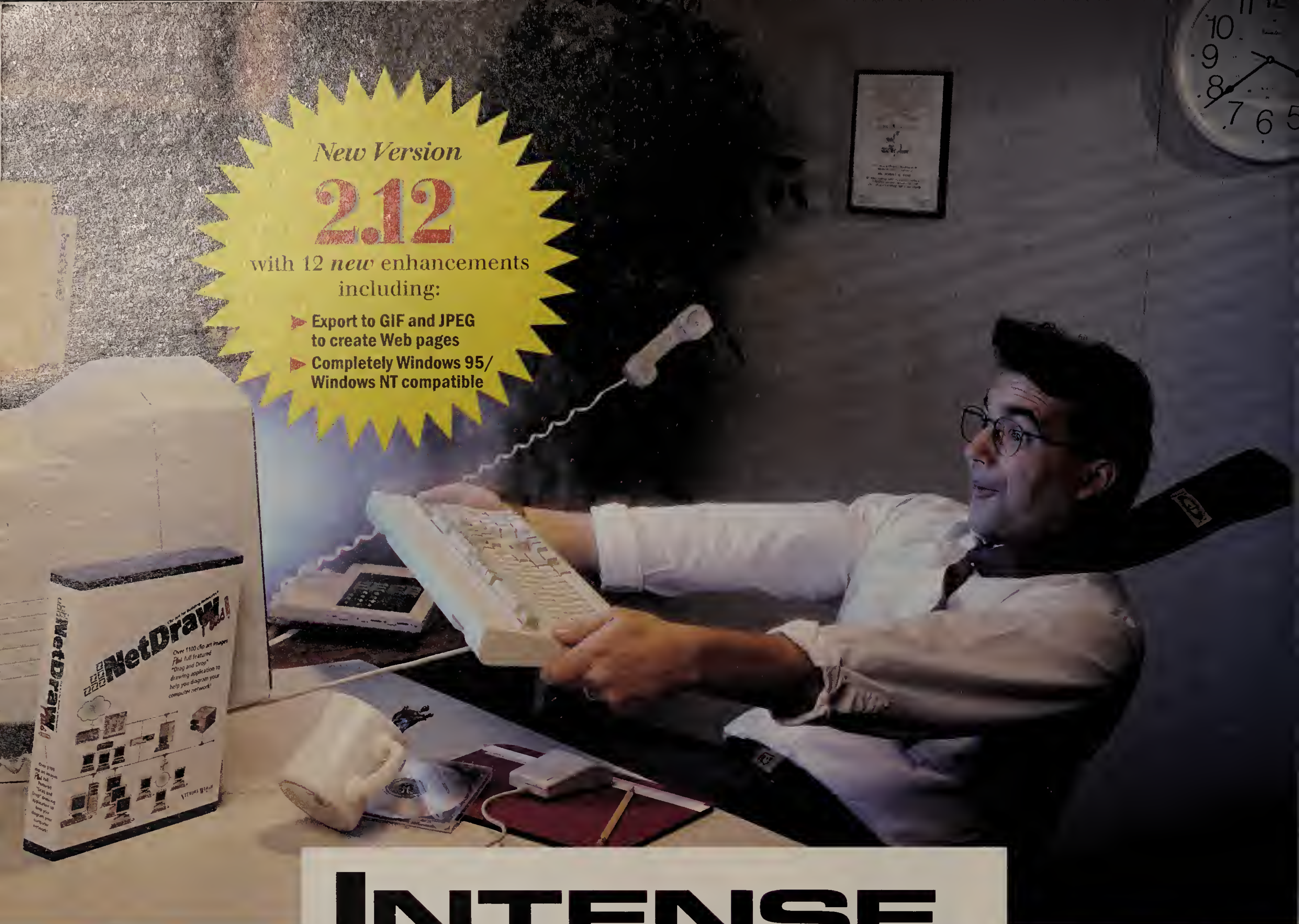
The chart on page 52 shows some of the most common types of SNMP-related management data that contribute to the overall network traffic load. You will not likely want to run all of the processes that generate these data types on a regular basis — not unless you have bandwidth to burn.

The bandwidth these processes consume is bad enough in a centralized management topology where there is only a single management station, but it can be a disaster in a distributed topology. That's because the traffic-generating processes are more intricate and because the chances of unknowingly running duplicate management processes — discovery and other polling operations — increases greatly with multiple, distributed management stations.

What type of management data is the most important? That depends entirely on your operation and your preferences. The distributed management architecture of some large networks is based almost exclusively on traps, with virtually no active polling taking place. Others ignore or eliminate traps and operate solely based on direct polling of managed devices by management stations.

In a nutshell, trap-based management can minimize traffic, but it is only effective if the managed devices you are most concerned with support meaningful traps and let you control the frequency and volume of traps they issue.

Polling-based management takes more bandwidth (polling traffic is two-way and continuous, unlike traps) but it provides a higher level of certainty that user-defined problems with specific nodes will be detected more quickly. For example, you will not know when a device goes down unless there is some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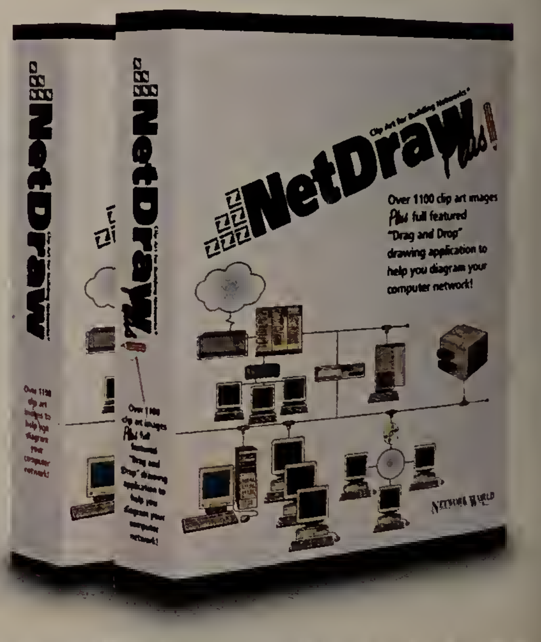
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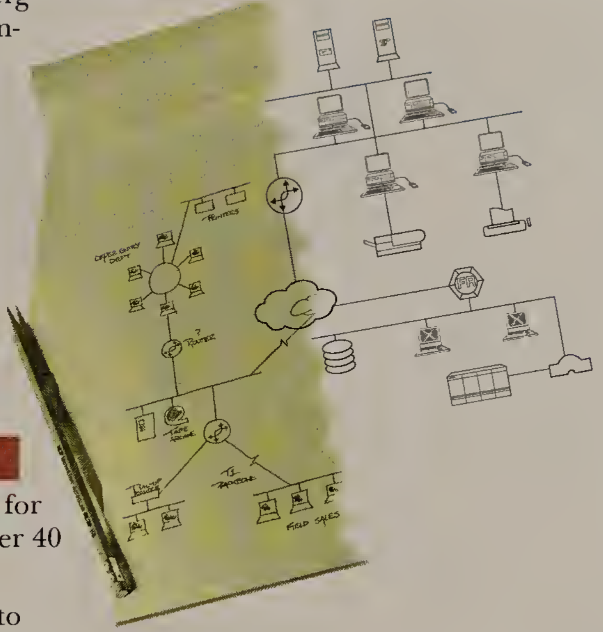
Directed and taught by Mark Miller, author of seven best-selling books on internetworking technologies, this seminar will teach you how to architect and implement multiprotocol, multioperating system internetworks that seamlessly integrate legacy and emerging technologies.



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- Understand the detailed operation of Ethernet, IEEE 802.3, token ring and FDDI, and key performance characteristics of these technologies
- Evaluate the differences between Transparent Bridging, Source Routing and Source Routing Transparent Bridging internetworking standards
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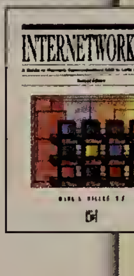

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OPTIONS FOR VIEWING NETWORK MANAGEMENT DATA FROM A CENTRAL SITE

Protocol/Technology	Examples	Bandwidth	Considerations
Telnet	HP OpenView command-line utilities	Low	Requires command-line retrieval of data in ASCII format
Event-based updates	HP OpenView, Sun Domain Manager	Low	Limited to predefined notifications and display changes
Graphical display of polled data	Sun Domain and IBM Mid-Level Manager	Low to medium	Can take as much or more bandwidth than if polling were done locally
Remote Console	Cabletron SpectroGraph; IBM NetView	Medium to high	Proprietary; but provides access to most of distributed station's functions
X terminal session	Sun Domain Manager; HP OpenView	High	Open standard; provides full access to all of distributed station's functions

polling to detect the absence of a reply from that device. If you rely on traps, you may only learn there was a problem when the device comes back up and you receive the customary cold-start trap. (Mier's Law of SNMP Management #12: Dead devices don't send out traps.)

Note, too, that some types of management traffic, such as status polling, are recurring and ongoing, while others are more infrequent, and in some cases explicitly schedulable, such as database synchronizations between distributed management stations. You will need to come up with the optimal mix for your environment given the tailorability of the management systems you finally select and your bandwidth concerns.

How much bandwidth?

Which leads to your next big challenge — determining the amount of bandwidth you have available for network management, or how much more you can afford.

The only way you can avoid adding to the traffic burden on your network is to carry management traffic exclusively over out-of-band, serial connections. But this kind of distributed management topology is awkward and fraught with problems. For example, many device agents either do not support out-of-band access (which involves SNMP over a serial TCP/IP link, like SLIP or PPP), or do not support it concurrently with in-band access.

Some users employ out-of-band SNMP communications for security reasons and as a backup mechanism, but most rely mainly on in-band access and focus instead on reducing the volume of management traffic.

The goal in most distributed architectures is to move the operations that generate the most management traffic as close to the managed devices as possible. You do not want to conduct heavy polling of every managed device from a central site over a WAN backbone. Rather, it pays to move a distributed manager out near managed devices — where bandwidth, usually via a high-speed LAN, is more plentiful — and then have the distributed station notify the central-site data collections for historical trend analysis. For intermittent and infrequent types of man-

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Dive deeper into net management online.

Mier Communications' latest special report, "SNMP Management for the Enterprise," provides detailed product comparisons and guidance on how to expand and scale SNMP management for large user organizations.

The Open User Recommended Solutions (OURS) organization has just released two net management-related white papers. The group's guides to evaluating event management and configuration management services include major functional requirements to look for and a disk with spreadsheets to help weigh results.

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agement data collection, such as checking to see if packets of a particular protocol have been appearing on a specific router interface, there may only be a marginal gain in bandwidth by directing a distributed station to do the data collection.

Getting the best view

Once you determine how much bandwidth it will take to collect management data, you have to decide how best to view it. This does not mean where you view management data from as much as it involves the protocol and mechanism used to move data to where you are.

There are standards-based and proprietary ways to view management data, given the current offerings of the leading management systems vendors (see chart, page 50).

If your network management scheme is structured around a centralized network operations center — one that is manned full-time, is expected to watch every network link or major node around the clock and know immediately when something goes wrong — there are several vendors that offer the type of distributed net management architecture you want.

Products from Hewlett-Packard Co., IBM and SunSoft, Inc. let you establish a single, central manager, from which the status of many thousands of nodes and links can be concurrently monitored in real time.

All three accomplish this by keeping the polling and other traffic-generating processes on this central display system to a minimum, and also by limiting the amount of data storage and data processing needed.

In each case, a single map display will usually be kept on the station's screen. This will typically show a high-level icon that represents each major network region, subnet, division or whichever network-segmentation plan you define. The high-level icon will usually change color if something under it has gone awry. By double-clicking on that and subsequent icons and maps, you can drill to the level where the problem has occurred.

All three vendors support this type of mega-status display station, which can reflect the current state of thousands of nodes and links. And each system is able to use a distributed protocol so only minimal status-change messages are sent from a potentially large number of distributed stations to this central-site system.

There are standards-based ways to tap into a remote network management station and access data — notably with telnet and X-terminal/X-server protocols. Telnet uses very little bandwidth, but it is a command-line-only protocol, so any data retrieved and displayed has to be in an ASCII/text-file structure. The other extreme is X-terminal, which gives you full graphical access to any of the remote station's displays and data. But its bandwidth requirements are enormous.

Still, X-terminal/X-server is the primary remote console access mechanism supported by SunSoft. Other leading management systems vendors — including Cabletron Systems, Inc., HP and IBM — have developed their own remote console protocol. These vary in bandwidth requirements, but all of them fall somewhere between X-terminal and telnet. And all of them are proprietary, meaning the remote console and the central server have to be running the same vendor's software package.

Another key to the performance of your distributed management system is where you position data repositories.

IBM KEEPS SOME TOOLS TO ITSELF

IBM has an analysis package it uses for load and performance engineering of prospective customers' SNMP-based network management infrastructures. The application may someday be expanded and offered commercially for generic net management design.

Depending on the management software you ultimately select, various options are supported with regard to database configuration, and where and how data files from polling operations are stored. But the general rule of thumb is to store your data closest to those users who need access to it.

Generally, a single database of the entire network topology — all the network nodes and their interconnecting links — running on a single, central management station can be an awesome resource burden. And it can appreciably degrade the performance of that system.

However, if most of the applications that analyze this data run on the central site system, then retaining a full copy there makes sense. Fortunately, some management system vendors now support methods of updating a central site database from a distributed station on an as-needed, intermittent or scheduled basis. The key benefit is that the same set of data can reside in more than one location.

HP and SunSoft both support periodic database merging between distributed management stations. Of the two, HP offers the broader set of options with regard to how each management station's database is configured. SunSoft, however, offers a broader set of options for controlling when and how frequently distributed management databases are merged and synchronized. It makes a big difference, too, where you store the results of short-term and long-term historical data collections. Unfortunately, the management systems vary with regard to their relative efficiency of moving collected data files among distributed management stations.

Resources permitting, it is generally more efficient to store large data collections on the station that collects them, then move the resulting file around using an efficient file transfer protocol. For short-term collections, it will in most cases be more efficient to poll from and store collected data at the viewing station.

Assessing contenders

Having determined your requirements with regard to the first four key issues, it is time to begin shopping and mapping the capabilities of today's distributed network management systems to your specific needs.

On the following pages you will find a side-by-side assessment of the latest versions of net management packages from Cabletron, HP, IBM and SunSoft.

Typically, in shopping for any hardware and software package where the price is likely to be in six figures, you may be prone to expect a perfect match between the product and your specific topology and requirements. That is not likely to be the case with distributed management, at least not any time soon.

As noted, the products available today are tools — not plug-and-play, out-of-the-box systems. Although most of the vendors offer training, installation and integration services for their systems (at extra cost, of course), you and your staff will nevertheless need to take an active role in ensuring the system that is ultimately built provides the optimum distributed management infrastructure for your organization, staffing and network topology. And that means a fair amount of customization will be required.

Mier is president of Mier Communications, Inc., a Princeton Junction, N.J.-based network consultancy, product test center and technical publisher. He can be reached at (609) 275-7311 or ed@mier.com.

COMPARING NETWORK MANAGEMENT DATA

	Traffic volume	Typical frequency	Source and target	Storage requirement
Node up/down status	100 bytes per managed node; bidirectional (often just a round-trip ping)	Min. once/minute/managed node; max. once/hour/ managed node	Distributed manager to managed devices	None, usually
Node configuration check	500-5,000 bytes per managed node; bidirectional exchange	Min. once/hour/managed node; max. once/day/managed node	Distributed or central manager to managed devices	2K-10K bytes per managed node; fixed storage within a database
Change notification or report (trap, event or alarm)	100-5,000 bytes per event; typically one-way transmission	Sporadically, as threshold is exceeded or change is detected	Trap: from managed device to distributed or central manager; event or alarm: from distributed to central manager	100-5,000 bytes per event; usually logged in a tailed log file (e.g., last 1,000-5,000 events)
Results of a polled data collection	Could be short, per-poll messages in real time or a large historical data file; mostly one-way transmission	Depends on the polling cycle or duration of the polling/data collection program	Typically from distributed to central manager	If not displayed in real time, then a disk file of typically 10K to 10M bytes
Manager-to-manager database merging or synchronization	Typically from 100K bytes to several megabytes; mostly one-way transmission	Varies with management system; may be automatic (if link is lost) or schedulable	Distributed to distributed manager, or distributed to central manager	Megabytes on sending and receiving stations
Software upgrade or configuration file (for managed device, like router or hub)	Typically from 100K bytes to several megabytes; mostly one-way transmission	Infrequently, usually schedulable (such as during off-shift hours)	File server or manager (BOOTP, TFTP, etc.) to managed device	Substantial; tens of megabytes

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BATTLE TACTICS

Arm yourself against network snafus with these four distributed management platforms.

BY EDWIN MIER

The Simple Network Management Protocol has become the victim of its own success. Designed to let a manager interrogate any network-attached device with an SNMP agent, the popular protocol has been overwhelmed by demands that it manage ever-bigger, even global, networks.

To keep up with the needs of large user organizations, leading vendors of network management wares have had to build on top of SNMP. What they have come up with is an assortment of architectures that promise scalability across complex networks using an array of new distributed features and capabilities.

NetworkWorld TEST ALLIANCE

But do they deliver? We discovered early on that the distributed architectures implemented by the vendors we tested were so different that a direct, apples-to-apples comparison was not valid. The summary charts starting on page 56 show some of the key results in areas where side-by-side comparisons make sense.

In short, we found IBM and Hewlett-Packard Co. excellent if you mainly want real-time status monitoring of very large networks. SunSoft, Inc.'s package was clearly the easiest in terms of setting up a distributed management system. And all four scale fairly well, enabling you to deploy multiple management systems to oversee large networks.

Covering the Spectrum

Cabletron Systems, Inc. cleanly separates the functions of a network management station into two parts. The client portion, called SpectroGraph, includes all the system's console displays and forms. The server portion, SpectroServer, contains the database management system (DBMS) and all the applications and daemons that actually do the polling and trap processing.

The concept, in a nutshell, is that any console can connect to any server anywhere. Consoles talk only to servers, which do all the direct interrogation of managed devices. A console can be running on the same machine as a server portion or on a stand-alone console platform on the other side of the world. Because the displays and forms for viewing management information are common to, and included within, each console portion, only the actual data values that plug in to these displays need to be sent over the network.

We found this arrangement to be an efficient use of network bandwidth. However, traffic is still generated during an active Spectrum console-to-server connection even if there is no visible activity, such as a display showing the real-time results of a polling operation. Based on several 1-minute samples we captured, we estimated this background traffic amounts to about 10K bit/sec.

We noted, too, some annoying limitations with the Spectrum arrangement. For example, different servers' databases cannot be merged or synchronized via message-based updating, so you cannot collect inputs from multiple distributed servers and get a tailorable, consolidated, real-time, big-picture view of a broad network topology. Rather, you have to serially connect your console to the servers that are in charge of whatever nodes or network portions you are interested in.

A server can retain multiple database images, each representing what could be an entirely different management domain of nodes, trap and event logs, polling parameters and so on. However, a central-site administrator cannot remotely cause an active, distributed server station to switch over to an alternate database image — in order for it to manage a different network portion, for example. It is possible to set up a server to automatically take over for another, but to do this, the server has to be dedicated as a hot-standby backup; it cannot be doing any other management work.

Similarly, a central-site administrator has a hard time changing the trap-handling parameters and configuration of a remote server. We found that the Trap Editor application also could not be accessed remotely on an active server.

The Spectrum system is built on a model-type structure. You cannot add a node to the topology map or database until you have defined a model type for that type of node. In other words, Spectrum will not tell you anything about a remote network node until you have first told Spectrum all about it. And defining model types is a tedious, nonintuitive process, one designed to be done offline; it is difficult to perform these updates on an active server.

If you have a large network consisting of a few of one kind of node, a half-dozen of another and so on, then keeping Spectrum's model types up to date is a daunting, full-time job.

SCORECARD

	Cabletron	HP	IBM	Sun
Overall score	**5.1**	**7.4**	**7.6**	**7.5**
Features 40%	6	7	7	7
Performance 20%	4	8	8	8
Flexibility and ease of use 30%	5	7	8	8
Installation and documentation 10%	4	9	9	7

Scores based on a scale of 1–10. Categories are weighted by the percentages shown.

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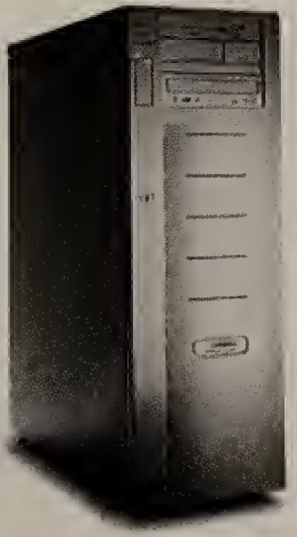
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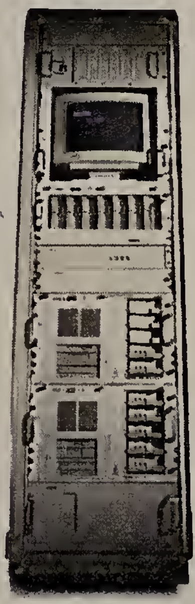
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Spectrum is not incapable of learning from packets it receives over the network, however. On the contrary, Cabletron built a lot of inference logic into the system. But sometimes Spectrum makes the wrong decision, as it did twice during our testing.

In one case, while collecting a list of all devices on the network, Spectrum "discovered" a couple hundred nodes that were not there. We were not sure why, but the Cabletron technician on-site had to individually delete all nonexistent nodes.

In another case, while first building a topology map of our small lab network, Spectrum decided that we had several unconnected subnets. We cut, pasted and connected them together in a single view, but Spectrum did not accept that our subnets, separated by a WAN link, were actually connected — even after the Spectrum system itself passed traffic over this internetwork for several days. Cabletron acknowledged this bug and said it planned to fix it in the general-availability version, slated to ship this month.

So how did Spectrum test-drive overall? Compared to its competitors, not too well. Of the three Spectrum nodes we ran, two were Microsoft Corp. Windows NT platforms, and the beta version of the new Spectrum software for NT exhibited a lot of problems, the biggest being extraordinarily heavy load exerted on the NT processor by the Spectrum software.

Even though we used 133-MHz and 90-MHz Pentiums, processor utilization whenever the SpectroServer was running stayed at 100%, upon which, given even a slight provocation (launching almost any Spectrum application), the NT system would invariably crash. Cabletron also reported after the testing that it had found some serious bugs in its NT package and planned to address those, too, before the 4.0 release formally shipped this month.

A final note on Spectrum: The package submitted for testing had no help files available, which severely limited our ability to find out how to make things work, and what went wrong when they didn't. But even so, we noted that a number of Spectrum's complex graphical user interfaces (GUI), most of which are not intuitive in our view, did not have a help button option.

HP expands OpenView

HP implements the new distributed management capability in the latest version of its OpenView Network Node Manager (NNM) through collection stations. An impressive set of features lets distributed OpenView stations manage their assigned domains yet keep a central-site management station fully informed in real time of changes that occur.

With the appropriate commands, the database of managed nodes and their topology resident on a distributed station is uploaded and merged into the central station's database. This generates an initial burst of traffic, but it is only done once.

After that, only changes that the distributed station detects to the status, configuration or topology of its managed nodes are sent back to the central station, which applies them to the central site's map and database. The changes are sent in real time in tidy event messages, a modified SNMP format HP has adopted.

The messages are delivered to the central station's TCP port that is the same port number used in User Datagram Protocol (UDP) — the normal transport protocol for SNMP messages — for the receipt of SNMP traps. In other words, HP has done a clever job of mapping its modified TCP/IP-based, SNMP-like message format to align with SNMP activity over UDP.

We tested this new functionality on two remote OpenView NNM stations, one set up as a distributed station, directly monitoring its own subnet, the other set up as a central-site manager of managers. We found it worked without a hitch.

At one point we caused an interface on a router being managed by the OpenView distributed station to go down. The change was detected on the distributed station as quickly as its user-determined status polling frequency allowed. The change was propagated to the central site and reflected on its map almost immediately after the distributed station found out about it. The change report from the distributed station generated about 2.7K bytes.

How does this compare to a nondistributed topology? If the central system were directly polling the same router's SNMP agent for all its interfaces on a regular basis, the amount of traffic generated would have been about 10 times that much over a 5-minute period. If the central station were observing the router's status via an X terminal session to the distributed management station, the traffic generated over a 5-minute period would have been about 10 times more than that (more than 360K bytes).

If you mainly just want to track the current status of all your nodes, management traffic to and from the central station drops to almost nothing. The central site continues to ping each distributed station, and if the central site's connection to a collection station is lost, a resynchronization merging of the databases is scheduled automatically when contact is reestablished.

HP's distributed architecture has other nice aspects. For example, you can give the same node one name on the central-site topology map and a different name on distributed management stations, even though the node is common to the databases of both. Also, the distributed architecture reportedly works whether the distributed and central-site stations are using flat files or third-party database managers to store information.

OpenView NNM also can connect multiple administrator consoles to the same management station in a manner similar to Spectrum's SpectroGraph. However we found that setting up this remote console capability in the HP environment was very difficult requiring a lot of command-line machinations and file editing.

HP's remote console capability, like Cabletron's, involves running many of the processor-intensive display applications on the console station, rather than on the management server, which significantly reduces the amount of network traffic

Comparison of key distributed management features

Distributed management task/function	Cabletron	Hewlett-Packard	IBM	Sun
Remote installation and configuration of distributed management software from central-site management station	Poor to fair. No GUI or integral features for remote installation. Mostly command line. Tedious.	Poor to fair. Limited. No GUI or integral features for remote installation. Mostly command line. Tedious.	Good. Facilities in IBM's Unix front-end GUI (called SMIT) for remotely installing MLM. Some command-line work is still involved.	Fair to good. Can be done using a mix of Solaris command-line and GUI interfaces, but no consolidated remote installation facility included.
Establishing management domains – discovery and setting up which distributed stations manage which nodes and network segments	Good. Detailed GUI for configuring and running discovery. However, some nonexistent nodes were found and the resulting topology map was incongruent. Manual editing of topology layout is tedious and nonintuitive.	Very good to excellent. Discovery of local subnet starts by default. It ran quickly and correctly mapped the topology. Setting limits of discovery and managing or unmanaging individual nodes or whole network portions is easy and fast via point-and-click GUI.	Very good. Setting up management domains is easy using the collections feature of the main NetView station's map GUI. Individual managed devices can't be cut and pasted. Controlling and changing discovery parameters of remote MLMs is tedious and difficult.	Good. Discovery, based mainly on ping sweeps, runs slowly. Proxy Agents use a Domain Manager's database. With cooperative consoles (multiple, distributed Domain Managers) there can be some confusion over which source database owns specific managed nodes.
Viewing and monitoring a remote, distributed station's management domain – nodes and segments – in real time	Very good to excellent. Clean separation of the console/display software (SpectroGraph) from the server/database portion (SpectroServer).	Excellent. Can be done: (1) via a collection station relationship, (2) via telnet and command-line facilities, (3) via remote console, or (4) via X terminal.	Excellent. With MLM, status of all managed nodes is kept current on the central system automatically.	Excellent, using the cooperative consoles capability. Changes to nodes and net segments that are shared are propagated almost immediately.
Database sharing; exchange of status and topology data between distributed management stations	Good. A relational DBMS is built into each server. Server nodes can't synchronize topology or node status information via update messages; complete database images must be moved.	Very good to excellent. Using collection station arrangement, topology databases are merged and rechecked for synchronization. Only changes are sent over the network.	Good to very good. MLMs can update the status of their managed nodes on multiple NetView hosts' databases. No database synchronization between NetView hosts.	Very good to excellent using cooperative consoles. Selection of what database elements to share is very tailorable. Database portions are merged, and users can schedule resynchronization checks.
Setup of polling-based data collection on remote, distributed station and retrieving the data for real-time viewing or for offline analysis at central site	Very good. Authorized display/console clients anywhere can set up polling collections on any server fairly easily, then view in real time. A GUI offers options for exporting long-term data collections.	Fair to good. Viewing polled data in real time can be done via an X window, but this generates much more traffic than polling directly from the central site. Data collection and retrieval can also be set up via an arduous command-line interface.	Good. A hard-to-use GUI is provided to create polling data-collection programs for MLMs. Once created, these can be applied to any MLMs. Polled data sent back individually in traps. Retrieval of full polled data files is difficult.	Very good to excellent. Setup of polling data collections is easy and flexible via Proxy Agent structure, as is setting up how data is retrieved and displayed at the central-site station.
Backup, takeover of a key central management station by a remote, hot-standby distributed management system	Very good. Servers can be set up to automatically receive or send their database images and retain multiple database images. A dedicated server station can automatically monitor and take over the management domain of another server.	Good to very good. Using the collection station features, the topology retained by a primary station can be continuously updated to a remote backup station. Some shell scripting by the user is needed for the backup to automatically take over management.	Very good to excellent. A central manager automatically takes over status polling of an MLM that dies. A backup application lets any NetView 4.1 host be preconfigured for active or backup management of any network portion. User must manually activate backup takeover.	Very good. Alternate Proxy Agents can be prespecified. Also, using cooperative consoles, maintaining the current status of network nodes or backup stations is tailorable. Invoking a takeover by a backup station requires a lot of manual work.
Remote-station trap control, management, filtering, viewing from a central-site station	Good. Can centrally view (but not retrieve) networkwide traps and alarms via optional application. However, a central-site operator cannot readily access or manipulate trap collection or filtering on distributed management servers.	Good to very good. All trap collection parameters can be accessed and set via an X window. Via collection station, select traps can be sent back to primary from distributed stations. Setting traps filters and some other trap/event handling is fairly complex and difficult.	Good to very good. Any NetView station's trap collection and handling parameters can be accessed and set via an X window. Configuring trap handling and filtering within MLMs is tedious, and must be done for each MLM one at a time.	Fair. Limited ability to control trap handling at remote, distributed management stations from a central-site station. No GUI facilities for centrally viewing a remote station's trap log or retrieving the trap file. Traps can be forwarded but not selectively filtered.

between the management station and the console. For an equivalent amount of map-display manipulation, HP's console connection generated only about one-third the amount of network traffic that an equivalent X terminal session would.

The HP system has its downsides. For example, the collection station architecture works well as long as all you need to do at the central site is passively monitor current network status. If you need to conduct investigations and poll specific nodes from the central site, you still generate as much traffic over the network as before.

Some alternatives do exist — for example, a central site can get a distributed station to run custom polling and data collection jobs — but we found that in most cases, these generate as much network traffic as if the central site were doing the polling or data collection directly.

The collection station structure includes some tailorable features, such as the ability to filter specific nodes, topology details and map information from the data that a collection station shares with a central manager. However, setting up these filters is extraordinarily complex. HP developed a programming language specifically for setting filters in the collection station environment. Unless you are a seasoned C programmer, you will likely find setting filters arduous.

With OpenView's collection station capability, it is easy to have a backup station maintain complete, up-to-date information on a set of managed nodes, or network portions, belonging to another distributed management station. OpenView has no trigger mechanism that automatically invokes a management takeover by a backup station, but HP says this could be done fairly easily via shell scripting.

Other problems with HP's distributed strategy? Well, a few rough edges and an operational bug or two turned up in the testing. Also, any enterprisewide deployment of HP's package is likely to involve a lot of Unix shell scripting and C programming to customize the system.

OpenView users are still fairly limited in their choice of platforms. Both for distributed collection stations and central-site management systems, users need an HP 9000 or Sun SPARCstation. HP offers versions of OpenView NNM for Solaris Version 2.3 or higher. And at $16,000 per OpenView NNM — $5,000 for a 100-managed-node version — a large distributed topology of OpenView stations does not come cheap.

IBM's Mid-Level Manager

The IBM solution to SNMP-based distributed management is well thought out, flexible and effective, as long as you are willing to commit to using just IBM's RS/6000 hardware and IBM's Unix. AIX Version 3.2.5 or higher is required.

Indeed, not even OS/2 can be a major player in IBM's distributed management strategy. IBM does offer a software package called NetView for OS/2, but its distributed interaction with Unix-based NetView is limited to one-way forwarding of straight SNMP traps; any generic SNMP manager can do the same thing.

Performance

	Cabletron	Hewlett-Packard	IBM	Sun
Network traffic efficiency: vendor's distributed topology vs. a centralized management architecture	Good: About 10K bit/sec is used for a static console-server connection, when minimal data is being retrieved. Other operations, such as schedulable database image transfers, can heavily load the network.	Excellent for collection station arrangement, where only predefined changes are sent as event messages over the net (only about 2.7K bytes per node-status-change event). Good for telnet/command-line sessions. Poor to fair for actions requiring X window sessions to distributed manager.	Very good with MLMs. Centralized status polling is largely eliminated; only changes are reported (about 2K to 5K bytes per change). Each NetView host still does full configuration-change polling of all managed nodes, which can be considerable, depending on polling frequency.	Fair to good, for distributed polling by a Proxy Agent; it can take as much or more bandwidth to retrieve the data than to poll directly from the central station. Very good with cooperative consoles, where only changes involving select database items are sent over the network.
Software stability, reliability and up-time	Poor. We experienced crashes on both Unix and NT platforms. NT problems related to high CPU utilization by Spectrum software (vendor says major bugs have since been found and fixed). Interaction between Spectrum Unix and NT stations exhibited ongoing problems.	Good to very good. A few bugs, most of them minor, although the execution of one command, involving configuration of the SNMP daemon, in certain cases crashed the system.	Excellent. Not a single software problem, hang, crash or hiccup in three days of solid testing.	Excellent. Not a single software problem, hang, crash or hiccup in three days of solid testing.

Big Blue's distributed architecture is based mainly on a special software package called Systems Monitor Mid-Level Manager 2.3, or MLM for short. MLM runs on a distributed AIX-based RS/6000 platform and acts as a remote observation post for a full NetView-for-AIX central-site management station. For $1,500 (for the software — you still need the RS/6000-AIX platform), you can have a lot of MLMs out there watching a big network. You need at least one full NetView for AIX station, as well.

Unlike the other products we tested, MLM is designed to be remotely installed. This can be done using IBM's graphical interface for AIX or, if you're a masochist, completely via a command-line interface. Except for one key administrative detail —setting of the read-write SNMP community name on the platform to which MLM is being installed, which is not addressed in the GUI interface — the remote install of this 4M-byte module goes pretty well.

Despite the Mid-Level Manager name, MLM is not a separate manager. It has no NetView database of its own, which is why it works only in conjunction with a central-site NetView. It doesn't support its own local monitor interface, either. To get the MLM to look like a regular distributed management station, we had to add a 32M-byte NetView remote console software module called NetView Client, which IBM offers as a $500 option with NetView for AIX.

While HP's remote console feature is free with OpenView NNM, it is a horror to install. You actually start by loading the full OpenView software on the console platform and then configuring only the OpenView GUI. IBM's NetView Client (console) is a separately packaged software module. It's easy to install, even remotely, just as MLM itself is.

MLM's primary goal is to off-load status polling from a central-site management system. Status polling, which is really just a periodic ping of each managed station, is the main mechanism in NetView for determining that a node is down. MLM can also perform ongoing discovery of network nodes, which can further lighten the load on a central-site station and reduce network management traffic across the backbone.

As with HP OpenView's collection station architecture, MLM sends updates to the central site via tidy event messages only when changes in a node's status are detected or if something new is discovered.

IBM's use of a single database, which is updated by remote MLM status-polling outposts, makes Big Blue's model quite different from Sun's and HP's distributed management approaches. Sun and HP require that their distributed managers be more substantial — running either full Domain, or Site, Manager or full OpenView NNM, respectively. The distributed nodes in the Sun and HP architecture each has its own database.

Each Cabletron SpectroServer also has its own database. However, where the topology databases of multiple Sun or HP distributed managers can be shared, partially or fully replicated and dynamically merged, multiple SpectroServers operate much more autonomously.

The IBM single-database/multiple-MLM approach can be viewed as the most tightly coupled, most centrally controlled distributed arrangement of the four products evaluated.

Even though a single database is easier to maintain and update than multiple databases running across multiple distributed nodes, and there's no concern about synchronization with a single database, it could also represent a vulnerability. While we found the IBM software and hardware environment to be among the most stable and reliable of the packages tested, what happens if the central NetView station, which is hosting the network's single database, goes down? You can set up a hot-standby central NetView node, which works alongside the primary and retains a disk-mirrored copy of the database.

It's noteworthy that multiple stations running the full NetView software, each with its own database, can also be deployed in an IBM distributed topology. But this amounts to a loosely coupled distributed topology because the remote stations cannot share database information, or dynamically update or synchronize each other, as distributed Sun and HP

Documentation and ease of use

	Cabletron	Hewlett-Packard	IBM	Sun
Help and documentation	Poor. No on-screen help files available for the late-beta version we tested. No context-sensitive help. Many screens and interfaces lack even a basic help button.	Very good to excellent. All GUIs and screens offer a help button, which provides useful guidance. Documentation is extensive and well organized.	Very good. Although there are a dozen different types of interfaces (some standardization is sorely needed), useful on-screen help is almost always nearby.	Good. Many of the GUI screens are not intuitive and need a help button. Full documentation is searchable online, but some details are missing and finding what you need takes time.
Ease of use: level of technical expertise required (using a 1 to 10 scale, where 10 is the highest level of technical expertise)	**5:** for monitoring a stable and static network via the GUIs; **9:** for most advanced operations, or for administering a dynamic network that requires frequent changes (new device types, adding MIBs, etc.).	**3:** for monitoring a network and conducting basic operations via the GUIs; **6:** for setting-up and conducting most administrator-level advanced operations; **8 to 9:** for fully configuring complex distributed topologies, and especially for defining/setting filters.	**3:** for monitoring a network and conducting basic operations via the GUIs; **5:** for setting-up and conducting most administrator-level advanced operations; **7 to 8:** for fully configuring complex distributed topologies.	**4:** for monitoring a network and conducting basic operations via the GUIs; **5 to 6:** for setting-up and conducting most administrator-level advanced operations, as well as for fully configuring complex distributed topologies.

nodes can.

The IBM MLM architecture certainly has its good points. Changes that occur out in the MLM's domain pop up almost immediately on the central-site topology map. And the traffic generated for a change report is trivial — only about 5K bytes.

Another definite plus: By conducting its own status polling of each MLM reporting to it, the central-site station will automatically take over the complete management responsibilities of an MLM that goes down.

An MLM typically forwards all SNMP traps it receives back to the central-site station. While it is possible to configure the MLM to filter these traps, and we did it successfully, the interface for this is especially tedious and difficult.

You can also "program" an MLM to conduct specific polling operation and data collections, with threshold-exceeding results sent back to the central site. However, the Agent Policy Manager interface that IBM built for creating these programs, while a point-and-click GUI, is still extremely tedious to use. By the time you set up the polling operation — applying the necessary Boolean logic and determining exactly what Management Information Base values to poll — you will likely find it faster to just do the polling from the central-site station.

A downside of the MLM architecture comes from the same degree of tight coupling with a central NetView station that makes it work so well: The link between the MLM and the central NetView needs to remain intact. The MLM's local data storage is limited — it can retain as many as 100 traps if offline and disconnected from the central NetView — but otherwise, it cannot do much on its own.

If you need a management station — say, a departmental class manager — for local use at the remote site where you are thinking of putting an MLM, then the MLM is not the right tool. It cannot do double duty as a distributed node for a central NetView and serve as a management station in its own right. In that case, IBM requires you to add a full NetView station at that site in addition to the MLM. If you go the NetView for AIX route, that's $15,000 for the software. NetView for OS/2 could be a contender in this scenario, but that would mean a separate Intel Corp. platform, and you would still need an RS/6000 for the MLM.

All things considered, though, we found the IBM MLM solution an effective one.

Rising Sun

If you thought that SunSoft had pretty much dropped out of the SNMP-based distributed management market, think again. SunNet Manager is back — in the form of Solstice Domain Manager. A low-end version called Site Manager, which costs only $1,995 compared with Domain Manager's $9,995 price tag, has virtually all the same software functionality but can manage no more than 100 nodes.

A major distributed management capability has been added in Version 2.3. After two or more Domain Managers have discovered the bulk of a network topology or the portions they are to be responsible for, their databases can be linked via what Sun calls cooperative consoles.

In this manner, one Domain Manager can be set up to synchronize its database or any user-defined portions of it with the database of another Domain Manager. Whichever manager discovers a node is the one that technically owns the node. It is called the source manager and becomes the manager that conducts all the ongoing management polling of that node.

If two cooperative console managers discover the same node, it is added to the database of both, and both then conduct ongoing polling. Cooperative consoles work best if you delete the node from the management station that you do not want to be polling the node on an ongoing basis. You are afforded considerable flexibility in filtering out what nodes or subnets you do not want to appear on nonsource stations. Then you establish the database linkup between two or more management stations. As with HP OpenView's collection stations, only changes are propagated from the source station to the management stations. In the Sun world, these are all carried using Sun's remote procedure call (RPC) protocol, which is not as efficient as HP's event-notification protocol.

Sun's cooperative consoles have a few advantages over HP's equivalent collection station approach. First, the Sun architecture is much easier to tailor. Setting up filters to determine what node and network data is shared is much easier with Domain Manager than with HP OpenView.

Also, the Sun architecture can be configured so that any combination of cooperative consoles can involve a two-way database synchronization, or just one-way. As a result, distributed management topologies can easily be made hierarchical or peer to peer, or some mix of the two. What's more, database synchronizations can be flexibly scheduled with Sun's cooperative consoles by time of day, day of the week or even not at all.

Another plus for Sun is that an Intel platform can be pressed into service as a full Domain Manager and cooperative console. It does not run over Windows NT or Windows 95, though; you have to buy and install Sun's Solaris for Intel operating system, which lists for $695. Once you have done that and have loaded Domain Manager, the operation, look and feel of the Intel- and Sun-based management stations is identical.

Speaking of look and feel, network managers used to the Motif standard for manipulating Unix window displays will get a culture shock with Domain Manager, which still uses the Sun-proprietary OpenLook/OpenWindows interface. Even though Sun's latest Solaris operating system supports both, Domain Manager has never been rewritten for Motif.

ONLINE

For a list of recommended configurations for organizations of different sizes, and the pricing for each configuration, check out Network World Fusion. Select NetRef, Reviews and Buyer's Guides, then Distributed SNMP Managers.

http://www.nwfusion.com

The cooperative consoles architecture works very well. We found just a few annoying flaws.

First, a central-site cooperative console station can view the status of a node that belongs to a distributed station, and any change to that node shows up immediately at the central site. While this lets you see almost everything related to a shared node from the central site, you cannot find out which polling or data collection processes the source node — or any other management station — are conducting on that node.

In fact, it can appear at the central site that no other polling is being conducted, which we found can be incorrect. As a result, the central-site station operator is apt to duplicate polling operations on the managed node. Generally speaking, Sun has done too good a job of making the status of nodes on cooperative consoles stations seem as if they belong to and are being managed by the sharing station. There should be a way to show which management station is the source manager of that node, and what polling and data collection jobs are already being conducted on it.

Another rough spot with Sun's architecture is distributed trap handling. Domain Manager is oriented around polling and polled data collection for most network management operations; trap handling hasn't been given the same degree of attention. It is not now possible for a central-site management station to selectively control which traps a distributed station does or does not forward.

Domain Manager supports a Proxy Agent, which is not really an agent at all, but rather a polling daemon that is structurally similar to IBM's MLM. Any SunOS or Solaris station (Sun SPARC or Intel) can host a Proxy Agent daemon running in the background.

A Proxy Agent communicates via the RPC protocol with a Domain Manager station, and the Domain Manager can easily load polling jobs on the Proxy Agent and also set up threshold monitoring, so that only events are passed back over the network. We found the Proxy Agent feature extremely effective and easy to install, set up and use.

The Sun package, with Proxy Agent and cooperative consoles, has many of the best features of IBM's and HP's distributed management offerings. Sun does not, however, offer any slick remote console capability. Currently, if you need multiple consoles operating on a Domain Manager, the Sun solution is to use X ter-

HOW WE DID IT

We tested the four vendors' offerings on their native platforms. A complete summary of each configuration is on Network World Fusion.

To test the distributed features of these four management systems, we connected each vendor's high-end platform to an Ethernet LAN to act as a central-site management system. On the same LAN, we connected a Hewlett-Packard Co. Internet Advisor analyzer, which was programmed to capture and track network traffic to and from the management system.

Also connected to this LAN was a LAN-to-serial remote IP router, which connected over a dedicated 256K bit/sec serial link to another remote IP router on another Ethernet LAN, simulating a remote site in a large organization's network.

On the remote LAN, we set up a variety of Microsoft Corp. Windows 95 workstations and Windows NT and NetWare 4.1 servers, configured on Pentium-based multi-PC systems from Chat-Com Corp. and Cubix Corp., as well as a UB Networks, Inc. Georim/E Ethernet switch and a Cisco Systems, Inc. AGS+ router, which was configured with an assortment of interfaces.

To capture and assess management traffic flow between distributed manager and agents, and between distributed and central-site managers, we employed a Wandel & Goltermann, Inc. DA-30c traffic analyzer on the remote-site LAN. We monitored traffic to help assess the relative efficiency of the vendor's distributed data-exchange protocol, as well as to compare the traffic generated for distributed management operations with the centralized alternative.

The two LANs and the WAN link, interconnected by the routers, comprised three IP subnets.

We tested more than 100 tasks and scenarios, generally grouped in five areas:

- Setting up and configuring remote, distributed management stations from a central-site network operations center; discovering the network and then allocating management responsibility (domains) among distributed management stations.
- Setting up polling operations and polled data collections to run on a remote distributed site, with results viewed in real time, and historical data files retrieved by an administrator at the central-site management station.
- Network topology map, database and node-status data sharing between remote distributed stations and among multiple administrators' consoles connected to the central-site management station.
- Control of trap handling across a network of distributed management stations.
- Backup – the ability of a distributed management station to assume the management chores of another, both on a scheduled, rotation-type basis and for disaster recovery.

minal sessions. Given the notoriously high traffic overhead of the X protocol, this is only a partly viable solution.

We tested all four of the management systems using their native flat-file method of storing network node status and topology data. Only Cabletron's SpectroServers come with a DBMS, Raima Corp.'s dbVista, which the company has integrated into its package.

Spectrum's data storage structure is fairly fixed; there is no optional flat-file mode of operation. The integral database does not have all the bells and whistles of some of today's Computer Associates International, Inc. CA-OpenIngres or Oracle Corp. versions. And Spectrum users do not have the option of supplanting the integrated database with one of these other commercial relational DBMSs, as IBM NetView and HP OpenView users do.

HP optionally lets users integrate third-party relational DBMSs from CA or Oracle. IBM also optionally supports these relational DBMSs, plus a couple more. Sun's Solstice Domain Manager uses and supports only flat files; there are no Sun or third-party relational DBMS options. IBM and HP admit that users will tend to see NetView and OpenView operations slow down with a relational DBMS. But both say that, for maximum data storage flexibility and access, one of the optional relational DBMSs is the way to go.

Three-horse race

All four vendors have been laboring for countless programmer-years to deliver this first wave of distributed management capabilities, and the results are encouraging. Each product has a few rough edges but, in at least three out of four cases, they do enable users to deploy scalable SNMP-based management architectures that work across very large networks today.

Cabletron's Spectrum does not now support the same degree of scalability as the other three. Multiple Spectrum console nodes — SpectroGraphs — can work on the same server and database. But multiple servers cannot dynamically interact or share information with one another.

Some sort of expanded, centralized overview capability may be coming from Cabletron, though. A new optional application called Enterprise Alarm View is a first step in this direction.

The application runs on one console and performs the job of collecting copies of the alarm logs from all SpectroServer nodes it knows about and showing them in a single, consolidated display. This same collection approach could be extended to providing a consolidated view of a very large network, gleaned from all the distributed SpectroServer stations.

As our Scorecard shows, we end up with what effectively is a tight three-horse race (see graphic, page 54). A single point difference between IBM, Sun and HP should not be considered significant. All three currently address distributed management with nearly equal effectiveness. And a score of 75 (the average for these three) out of 100 is a good approximation of where they are at — about C or C+.

There is definitely room for improvement in each case, and the final outcome will no doubt depend on the improvements they respectively make in the short and long term. A key deciding factor may be which vendor first delivers a full distributed station capability that runs on Windows NT. True, Cabletron has an NT version of Spectrum, but our testing found it needs more than a little work.

HP has indicated that a port of OpenView NNM to Windows NT will be available by year-end. IBM has indicated similar intentions but without a commitment date. It is unlikely that Sun, which views Solaris on Intel as the equivalent to Windows NT, will seriously pursue a port of Domain Manager to Windows NT anytime soon. ■

The alliance is a cooperative of users, consultants, educators and integrators that applies its technical and business skills to analyze and compare strategic network products. A list of alliance partners can be found on page 45.

Mier is president of Mier Communications Inc., a Princeton Junction, N.J.-based network consultancy, product test center and technical publisher. Mier can be reached at (609) 275-7311 or via E-mail at ed@mier.com.

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Benchmark

Continued from page 1

Line Co. (PEPL) and Ryder System, Inc. — the latter two being co-winners of *NW's* 1995 User Excellence Award.

"There's a huge desire to benchmark all this new stuff, but almost no one is doing it," says Val Sribar, vice president and service director of META Group Inc.'s local networks research program.

Those companies that do undertake such efforts often "fall short of tying IT and networking costs directly to business values," says Jim Harrison, vice president and director of META Group's Metrix Benchmarking Service. Representatives of META Group, which aids users in benchmarking with its Metrix service, guided the roundtable talk.

Paul Brown *(left) wants surveys that are more than "smile meters," while* **Jim Hamilton** *warns that myriad variables can skew benchmarking efforts.*

Try triangulation

Network benchmarking efforts often fail because they do not embrace a triangulated approach, Harrison says. This involves examining quantifiable improvements to the business, surveying customer satisfaction and taking into account the fair market pricing for a comparable service by a third party.

"You have to accept that you can be fairly precise with benchmarking the cost side of the project, but also realize that measuring the benefit side is an imperfect science," Harrison says. "There's no silver bullet to get around that."

Surveying internal IS customers often is a tricky ordeal, users say.

Helix Health recently completed its first user satisfaction survey. Although Brown and his staff garnered some useful information from their customers, he labels the survey, which he did not design, "essentially a smile meter."

If you approach users one-on-one, Brown and others agree, you'll get a different picture. "They'll moan and groan about their networking problems," he says.

Brown worries that he and others may be "digging ourselves a hole" with surveys that foster false impressions. But he is unsure how to better focus questions to get at the impact network services have on the business objectives.

"If we knew what we wanted as an answer, we'd ask the right kind of question," Brown says.

The trick, Harrison says, is to keep the questions broad based for users who work outside of IS. "Most end users are not aware of the discrete underlying services that make up the net," Harrison says. Ask them about access to the network and about the perceived value of the network to facilitate doing their jobs, he suggests. Keep questions focused on a macro view of network services.

The easiest element of a benchmarking endeavor, he adds, is to assess a fair market value for the service or technology in question. To do this, you should look at the cost of the service delivered by peers in similar industries and also examine the cost of the service offered by outsourcers.

"The outsourcing cost is often a truer measure to benchmark against because that's the service you may compete against in the long run," Harrison says. Also, outsourcing shops are following a consistent method of pricing — say, for managed desktop PCs. Their services are priced on a flat rate, per-user, per-month basis, Harrison says, making it easier for internal net groups to benchmark against.

"The more custom the service or environment, the more difficult it is to benchmark a fair market value," Harrison says. For example, he explains, it's often tough to determine the value of internally developed applications because users point to unique functions of that application to quantify its value to their operations.

"Function points are an inherently imperfect measurement for any type of fair market value analysis," Harrison says.

On the other hand, it is possible to benchmark a fair market price for delivering and implementing a custom version of an off-the-shelf application, such as SAP AG's R/3. You can examine 10 different SAP environments and identify enough areas of commonality to perform a benchmark, Harrison says.

Peer progress

Triangulation isn't the only approach to benchmarking.

Take PEPL, for example. The Houston-based gas transportation company decided on a massive client/server migration two years ago, giving up its reliance on a hodgepodge of host-based systems. At the same time, a sister business unit chose to stay the course and rely on mainframes.

"We had a built-in benchmark," says Bruce Woodland, who was then director of PEPL's computer systems. Woodland has since joined Atlanta Gaslight Co. as manager of technical services.

Since the cutover, Woodland's PEPL unit is processing information about three times faster than it did on the host systems. The company invested about $4.6 million on its client/server migration, an investment that has paid off handsomely: $2.3 million in savings in 1994, $4 million last year and a projected savings of more than $4 million this year. Meanwhile, the cost of ownership for PEPL dropped 20% per year between 1992 and 1994. In contrast, its mainframe-bound sister unit continues to struggle with net costs roughly four times that of PEPL.

Companies not in the fortunate circumstance of being able to compare their operations to that of a peer in the same vertical market often find it more of a struggle to prove the value of technology to upper management.

One organization that seems to have made significant strides in this area is Amoco.

"Probably the most important thing we did was partner with the research community," says Dave Beering, a senior telecommunications analyst who works at Amoco's Chicago offices. Amoco is spearheading Project Aries, an ambitious undertaking that relies on Asynchronous Transfer Mode technology to ferry crucial oil-drilling information among key decision makers.

Amoco and its project partners embraced ATM in its infant stages. In order to understand what the technology could do and how it should deploy it, Amoco benchmarked the experiences of national laboratories and two National Aeronautics Space Administration centers that had experience with ATM.

"We discovered that these research centers are typically five years ahead of the market, so if we wanted to get a good picture of what two years out looks like, these people would give us a much better view than anyone else," Beering says.

By inspecting the ATM endeavors of its research partners, Beering's team gained answers to several questions: Will the nascent technology work? What can we do with it? What are the hurdles?

"Issues we looked at as highly challenging they had already addressed," Beering says. Armed with real-world data about ATM, Amoco's net team was able to paint a clear picture of how the technology would redefine oil exploration processes and what impact those changes would have on revenue. "It was a very effective benchmarking," Beering says.

Valid data

One of the problems users face with benchmarking from a strategic perspective is the validity of the data. Jim Hamilton, a former project manager at Miami-based truck lessor Ryder System, says there are often too many variables to consider.

His organization undertook an ambitious effort to benchmark the effectiveness of an internal asset management application that helps executives manage the company's fleet of trucks. Ryder decided to look at truck utilization rates before and after the net application was deployed, figuring increases could be attributed to managers having better information at their fingertips.

Utilization rates did indeed go up but Hamilton and others began t question if that variable alone — th new application — was responsible.

"The answer appears to be yes," Hamilton says. "But there's a whol world of other factors, too. Did th economy improve? Did the competition ease? In a sense, you wind up trying to control a multivariable equation, and you never walk awa with a definitive answer."

META Group's Harrison agrees. "Th problem lies in the qualitative assessmen of how much of the business success ca be attributable to IT changes made," h says.

In the end, network executives agre that benchmarking is a necessary tool f helping identify tactical issues — such the personnel required to run a rout network or the acceptable response tim for servers. But benchmarking is als necessary for more strategic purpose namely to help network IS better positio its worth in the company.

As Amoco's Beering puts it, "We hav the opportunity to enlighten peop about the strategic value of the techn ogy, rather than labeling it as a tactic solution." ■

ONLINE

Get help with your benchmarking efforts, via Netwo World Fusion, from groups including:

- The Benchmarking Exchange. This group offers a benchmarking code of conduct, hotlinks to Web resources, and other related information.
- The American Productivity & Quality Center (APQ and International Benchmarking Clearinghouse. Thes folks can point you toward benchmarking case studie Common Interest Groups and benchmark planning services. The APQC also offers guidelines for organizations that intend to benchmark their process with competitors.
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Briefs

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Specialization makes for efficient distributed LAN administration

By Lenny Liebmann

In a never-ending quest to streamline LAN administration and hold down costs, many companies are promoting a higher degree of specialization among technical staff and leveraging those skills across the enterprise.

This is a shift from relying on someone in each department to perform all LAN administration duties — a holdover from the days when LANs first infiltrated the corporation and were maintained by departmental staff.

At that time, it made sense to put the departmental PC enthusiast in charge of everything from installing network adapters and configuring servers to distributing software and supporting end users.

As LANs expanded, information systems (IS) organizations took charge of things, and the position of LAN administrator became formally recognized. By and large, IS inherited an army of PC enthusiasts with little or no formal training who essentially baby-sat the LANs within their territory.

These people were saddled with a range of responsibilities that prevented them from gaining in-depth knowledge in any single strategic aspect of networking and were often at odds with each other over how to implement enterprisewide LAN services.

But corporate technology managers now see this territorial approach as inefficient and impractical. The balkanization of network supervision results in too much of the personnel budget going to people with redundant, low-level skills — ones that are not effectively amortized across the company's infrastructure. Plus, the approach fragments control of network resources and leads to inconsistent practices.

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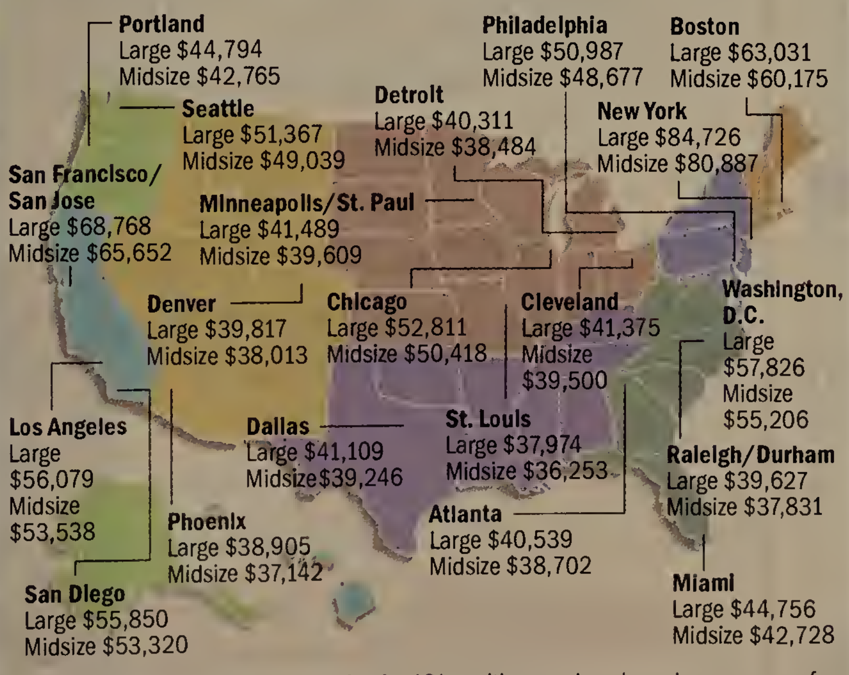

Note: Figures reflect average salaries for 161 positions and are based on a survey of 105 Southern California companies. The data was adjusted using U.S. Department of Labor statistics to reflect regional cost-of-living differences.

SOURCE: POSITIVE SUPPORT REVIEW, INC., SANTA MONICA, CALIF.

To solve the territorial LAN administration problem, efficiency-conscious executives are no longer allowing network jacks-of-all-trades to proliferate. Instead, they are consciously promoting specialization. Thus, the industry is seeing the emergence of official postmasters who are in charge of the companywide electronic mail system, desktop gurus who are dedicated to knowing the ins and outs of the corporate operating system of choice, and disaster recovery specialists who have responsibility for all file backups and net failover provisioning.

Of course, simply adding these positions to the existing staff would send payroll costs skyhigh. So today's administrators are being groomed to become specialists. These new LAN administrator/specialists typically remain dispersed throughout the organization and retain some degree of responsibility for their departmental LANs. But they have been freed up from enough housekeeping chores to enable them to add real value in key technologies including imaging, computer telephony and the Internet.

"You don't want centralization as it was in the glass house days," explains John McConnell, president of Boulder, Colo.-based McConnell Consulting, Inc., which specializes in network management issues. "But you want your experts to be globally available, so no matter where the problem is, they can take care of it without having to go there."

And the network itself is making that possible. Instead of all LAN administrators executing their own backups or driver updates, one or two technicians can do the job across the enterprise using distributed processing and management tools.

Another important benefit of promoting expertise is that it helps organizations retain and recruit the type of ambitious, highly motivated people everyone wants.

"If you're offering the opportunity for professional growth, it's much easier to attract the kind of people you want," says Dan Vantucci, chief information officer at ITT Fluid Technology Corp. in Midland Park, N.J.

Vantucci has implemented an expertise-building program called Centers of Excellence, under which local administrators have been given global responsibilities for either strategic technologies or LAN maintenance tasks. "The Centers of Excellence have been very successful in enabling us to move forward without overburdening our payroll," he says.

Getting strategic

Other factors are enabling companies to extricate themselves from counterproductive territorial staffing. One factor is the improved manageability that has been built into network operating systems themselves. Another is the growing popularity of outtasking, whereby nonstrategic LAN functions are off-loaded from internal staff altogether, leaving them free to concentrate on the more mission-critical issues.

Emerging Java-style applets for network management may help, too. Because all tasks would be executed from a Web browser, technicians should be able to use whatever kind of browser-equipped desktop they happen to be sitting at.

Those in charge of network staffs should follow these developments closely and take advantage of the means they provide for consolidating operations and building in-house expertise. As pressure mounts to do more with less, the reexamination of staff structures and skill building can result in more cost-efficient management practices.

Liebmann is a consultant and writer in Highland, N.J., specializing in networking technologies. He can be reached at 11@interserv.com or (908) 872-8500.

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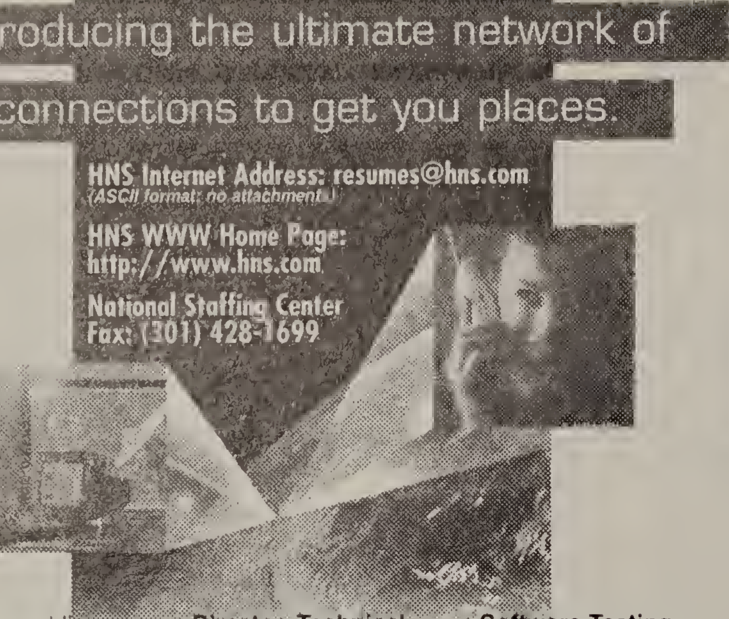

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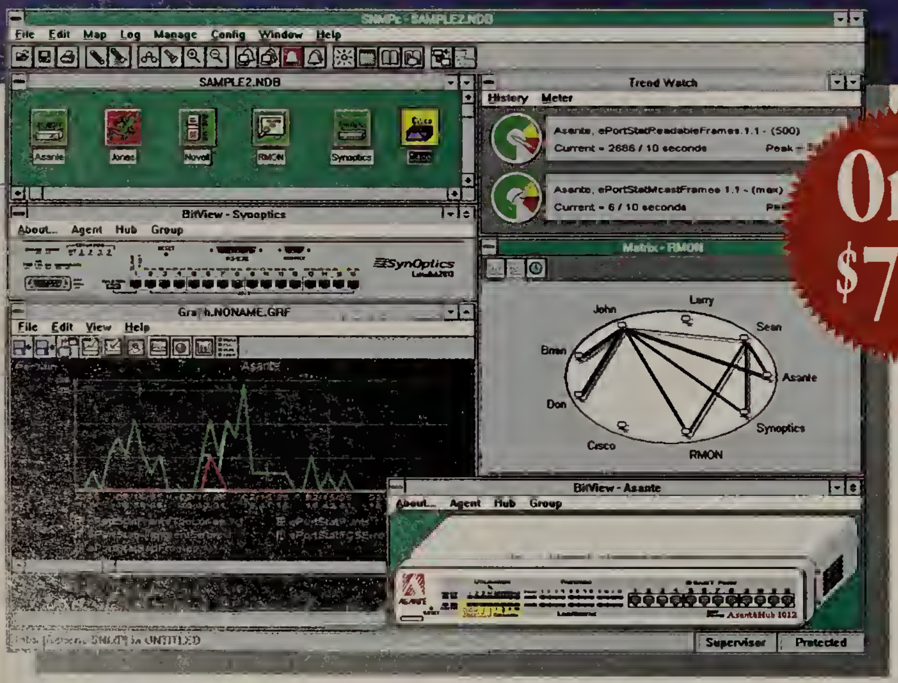

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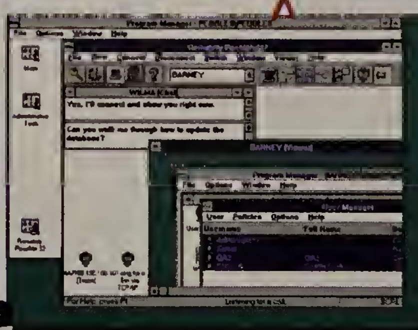

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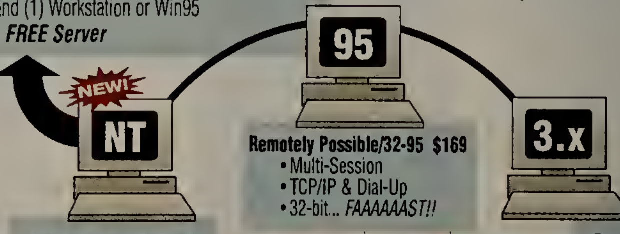

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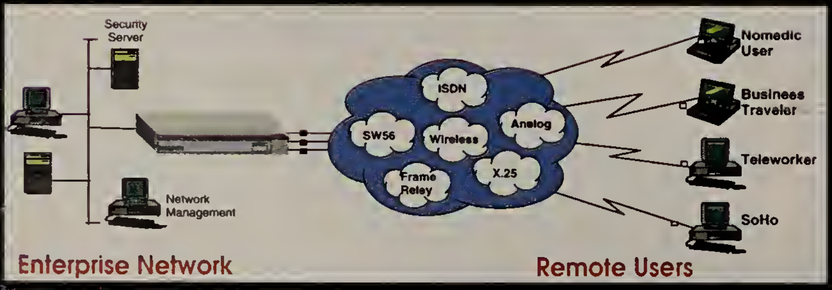

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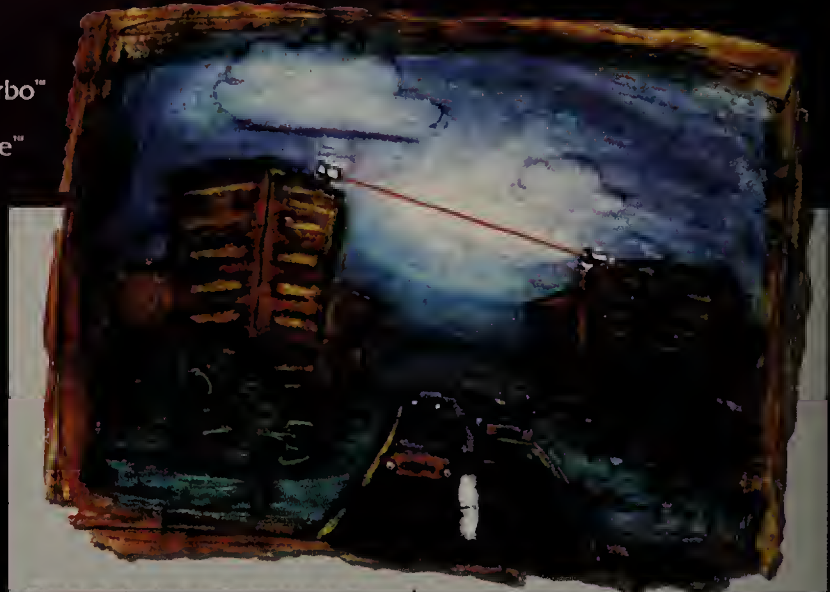

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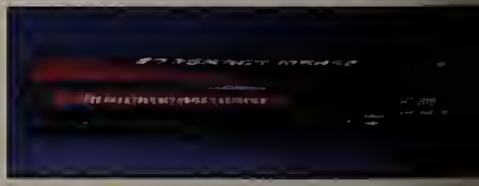

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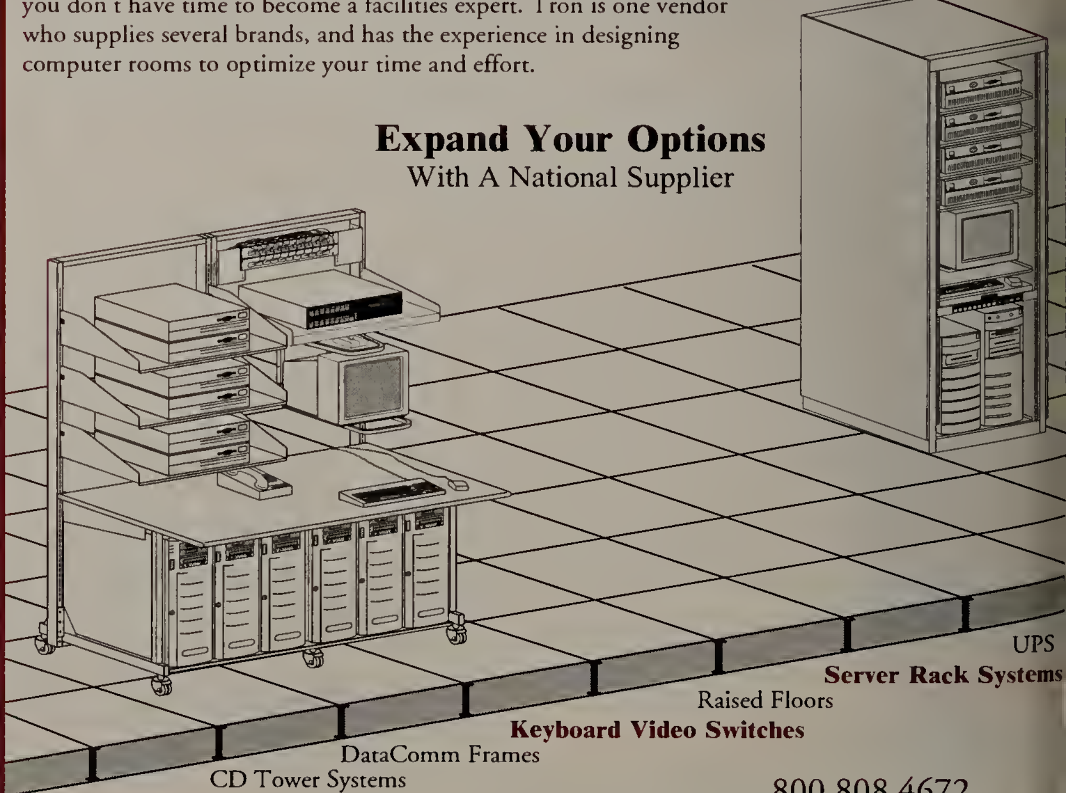

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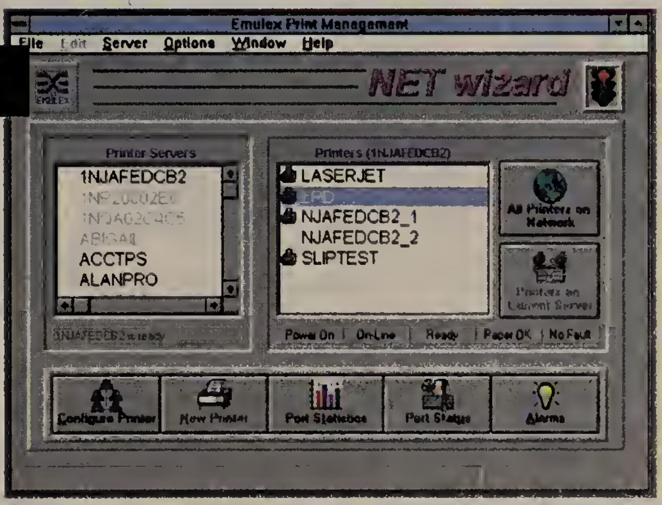

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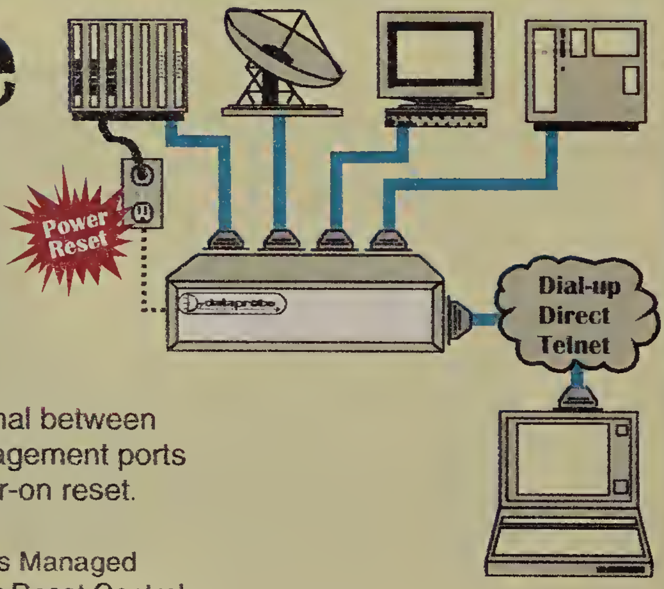

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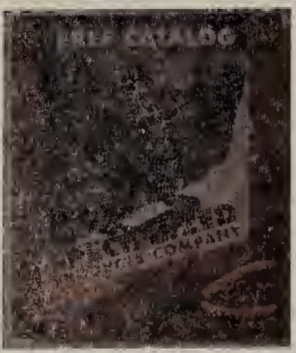

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Devices

Continued from page 1

(NC) reference profile, a set of architecturally neutral standards, features, functions and protocols that the new devices will share.

This will ensure that models and applications developed by different manufacturers are able to interoperate.

Ellison

Designed for network and Internet/intranet use, NCs that adhere to the reference profile will all support a Java-based programming environment, TCP/IP protocols, File Transfer Protocol, Simple Network Management Protocol, HTML, HTTP, Internet mail standards and various multimedia and graphics formats, including JPEG and GIF.

Security and optional standards include ISO 7816 SmartCards and the European MasterCard/Visa standard.

But more important than the reference profile, to be made available in July, are "the players involved," said Chip Gliedman, a Santa Clara, Calif.-based industry analyst with The Giga Information Group.

"Remember six months ago, it was Larry Ellison standing out there on the bow of the ship saying, 'We're sailing across the ocean, and there is land over there.' And there were a whole lot of skeptical people sitting on the deck. Well, now we're at least seeing the seagulls. These seagulls don't fly too far from land," Gliedman said.

Noticeably absent from the flock is Microsoft Corp. Oracle's Ellison has acknowledged that part of his motivation stems from a desire to end Microsoft's monopoly on PC software standards.

But Gliedman thinks that even if the Network Computer takes off, that won't mean Microsoft loses. "They'll sell far more servers than they would otherwise. The profit comes on the server side," he said.

The hardware that companies build may take a wide variety of forms, from pagers and video phones to palmtops and laptops and even conventional-looking PCs.

All the devices will be linked to the Internet or an intranet and will run basic applications such as Web browsers, electronic mail, word processors and spreadsheets.

NC stamp of approval

Devices adhering to the NC reference profile will carry a stamp indicating their compliance, sources said.

NCs can run both network-resident and stand-alone applications, but typically they will be dependent on the network. While the NC reference profile requires that companies support Java, they soon may be throwing their support behind another standard.

By month's end, an operating system designed specifically to run only Java applets and applications will be unveiled by Sun. Called Kona, "it has just enough OS functionality to make Java run," said Jim Mitchell, Sun subsidiary JavaSoft's chief technical officer. "It will be applicable in small-memory devices like cellular phones and pagers."

Among the Kona licensees that Sun hopes to announce at its JavaOne conference in San Francisco next week are IBM, Apple Computer, Inc. and Netscape. It also hopes to enroll other computer manufacturers, cellular companies, chip makers, and printer, copier and telecommunications suppliers. ■

The many devices of IBM

Not wanting to be left out, IBM is building low-cost network computing devices of more than one stripe, some of which will hit the marketplace by the end of the year, a company source said.

Some might be "thin clients" such as pagers or telephones, the source said.

Meanwhile, IBM's PC Co. has been showing off prototypes for an "interpersonal computer," company sources said. One unidentified corporate European customer already has bought 200 to 300 of the devices that were specially designed to suit its needs.

There is no memory, no disk drive and no software since that comes from the network, sources said.

"The monitor and the computer are one unit. They derive their intelligence at the network, but they do have some intelligence at the base as well, so they're not dumb terminals," an IBM PC Co. spokeswoman said.

In addition to that customized pilot, another half-dozen or so customized versions are being tested in the U.S. and Europe to help IBM define what customers want the devices to be.

"They're not all the same. We started out with about 15, and we've thrown some away. And we're currently testing and developing certain units. We want to make sure that whatever we deliver has value to the customer," the spokeswoman said.

She said that the IPCs could be generally available this year.

— Carol Sliwa

Start-up makes Internet pitch with PDA

Boston-based Momentum, Inc. has a challenge to Oracle Corp.'s hyped but nonexistent $500 Internet appliance — an Internet-ready personal digital assistant (PDA) priced at less than $200.

The $500 device is "a sacrifice more than a solution," said Rich Kosowsky, Momentum's chief executive officer and president. "You're throwing out a hard disk and the ability to run applications off-line."

Four-year-old Momentum has tossed into the ring NetPad, its 1-pound, small-screen, videocassette-size Internet access device. NetPad lets users surf the Internet and use electronic mail.

Momentum is also negotiating with companies, such as discount brokerage houses, that want to let customers check their accounts or initiate trades online via the PDA.

The device works with a server running Momentum's LinkPad application and either Windows NT, OS/2 or Unix. The server, which translates HTML documents, can be accessed over regular phone lines, a packet-switched data link or an X.25 connection.

Contact Momentum at (617) 262-2466.

— Rebecca Sykes, IDG News Service, Boston bureau

Net Computer

Continued from page 1

"I would like to be able to replace our expensive desktop computers in our local offices with a low-end piece of hardware," said Andy Catts, technology director for Maryland's Dept. of Labor. "That type of hardware would be of interest to us because it's supposed to be a very cheap mechanism to deliver applications."

Catts said the state is developing applications primarily to provide information over the Internet to job seekers, not to process complicated transactions such as airline reservations. He acknowledged that he's intrigued by the Network Computer.

GOING PUBLIC

By 1999, Internet terminals will be available in airports, hotels, aircraft and other public places, according to First Albany-META Technology Research. Mobile users using these terminals will be able to access thin client applications from the corporate intranet.

"There is a high cost in maintenance of computers," said Lee-Lan Cwikla, project leader in communications products engineering at Leibert Corp. If the Network Computer can simplify software distribution, companies are certainly going to give it a chance in the corporate network, she said.

Some say the device may find a variety of roles to fill. "I'm sure it has appeal in some applications, maybe a help desk," said Steven Chabra, senior vice president at Chase Manhattan Bank.

But the approach has its IS critics. "Right now, I don't think it's usable," said Mike Lisner, senior software engineer at Eastman Kodak Co.'s research division, which is experimenting with Java on the Kodak corporate intranet. "There just aren't enough Java development tools."

Prospective vendors should be glad they are not selling boxes to the analyst community, which gave the concept a good bashing.

Many analysts are skeptical that a Network Computer using Sun's upcoming Kona operating system will dislodge Microsoft Windows PCs in corporations.

"The price of PCs is dropping rapidly, so you might as well run Windows," said Joel Scotkin, president of consultancy Random Walk Computing, Inc. in New York.

The NC paradigm presupposes access to a server on the intranet or Internet, and that may not always be the case within organizations, he pointed out. Scotkin said he thinks the NC approach will only work as a handheld device such as a personal digital assistant, or in a dedicated process, such as a digital TV of the future running Java.

"It's neither fish nor fowl. That could be the whole Achilles' heel of this. The corporate market won't know what to do with it; the consumer market won't want it. What happens then?" said Bob Flanagan, an analyst with the Yankee Group in Boston.

The biggest threat to this new technology is, ironically, old technology. "People are just not going to give up Microsoft Word for some Java-based low-end word processor. We would expect them to have a limited market as a replacement for PCs," said David Folger, a Burlingame, Calif.,-based analyst for the META Group, Inc.

Folger, however, does concede that they may find a market as dedicated single-purpose devices such as terminals, tellers and kiosks. For instance, a manufacturer might put one on the plant floor for calling up documents, he said.

Other analysts were more kind. Phillip Meese, director of technical services with New York-based consultancy Mercury Technologies, Inc., said Kona will free network managers from the task of configuring software on the desktop. Meese added Sun is known to be building Java into microchips, too.

One analyst sees corporate possibilities. Just not instantly.

"The early market for these machines is clearly in the corporation," said Chip Gliedman of the Giga Information Group. "There's no home market today for Network Computers. And, even as you look at business, you're looking at 18 months to 24 months from now until the hardware, the applications, the tools will all be in place to really let somebody roll out any kind of real robust business application."

However, Gliedman thinks that for a given class of users, "NC or NC-like devices are probably all they need and they'll probably make MIS' job far easier in terms of administration." In short, NC devices may be a good fit for some companies, he said.

Gliedman sees long-term market potential for "second, third, fourth devices into the home" five years down the road. ■

Java

Continued from page 1

research report that detailed how hostile applets can be sent out to victimize an organization's computer networks behind the firewall was a hot topic of discussion at the conference last week. There is no interapplet security, so one applet might be able find out what other applications are working on in a machine.

Experts say Java is woefully lacking in security controls to prevent attacks from hostile applets. "The security stuff scares the bejesus out of me," Booch acknowledged.

"Sun wants to know the flaws and is trying to fix them," said Henry Wong, a Sun systems engineer at the conference. When it comes to implementing security against those who maliciously exploit vulnerabilities, "it will be an arms race to see who wins," Wong acknowledged.

Sun is working closely with Princeton on the security holes. Java 1.1, to be released next month, will include security features such as digital signatures and encryption to build controls into applets.

According to Philip Meese, director of technical services at New York-based consultancy Mercury Technologies, Inc., the security scare has some bank MIS departments ordering everyone in the corporation to turn off the Java feature in their Web browsers to prohibit downloading of Java applets off the Internet.

Grady Booch *says Java's security "scares the bejesus out of me."*

But some of these same banks will put their own Java applets on the Web for their customers, Meese added.

Attendees also questioned the much-ballyhooed platform independence of Java, which is said to be so portable you can write code once and have it run on multiple platforms.

Java's purported platform independence "has to be taken with a grain of salt," Meese said. He found with a Java client/server chat program, Windows 95 and Windows NT didn't mate all that well with Unix when using Java's multithreading capabilities. The Solaris platform locked up, Meese said.

"The question is: Can it be tweaked and made to be right, or is it a long-term problem?" Meese said.

Another concern is that Java applets have been known to dynamically consume memory to the point they actually take over a computer. Java's garbage collection feature lets an applet reduce its size after performing a process, but if the applet is poorly written, "it will grow and grow," Booch said.

Companies eager to check out Java for use on the corporate intranet say their efforts have been slowed anyway since they cannot find good Java tool kits.

"There just aren't enough Java [graphical user interface] and database access tool kits," said Mike Lisner, senior software engineer at Eastman Kodak Co., which is testing Java across its intranet.

Today, there are few full-blown Java applications, and most work is being done on applets made by small groups of programmers. The development tools today by and large do not meet the needs of larger development teams, Booch said.

But Java nevertheless holds so much appeal that financial firms such as J.P Morgan & Co., Inc., Morgan Stanley Group, Inc. and Merrill Lynch & Co., Inc. are aggressively pursuing the use of Java for such applications as foreign-exchange calculation.

"Java is an elegant language," said one ardent Java enthusiast, Joel Scotkin, president of consultancy Random Walk Computing, Inc. "It's reusable code, and you can develop the code much faster than the C++ equivalent."

But Java lacks a standard interface definition for how to map between Microsoft Corp.'s, Common Object Request Broker Architecture and Java objects, or between databases, Scotkin pointed out. This forces users to pioneer paths in these areas.

"It took 8 years for C++ to be accepted," said Lee-Lan Cwikla, project leader for communications products engineering at Liebert Corp., which is testing Java. Cwikla said Java 1.1 will further boost Java's acceptance. ■

Trio

Continued from page 1

dominant player. Cisco, which was not invited to join, has roughly a 70% share of the router market and a 50% share of the Ethernet switch market.

"The alliance's content has merits but [the members] need to go farther with this," said Frank Dzubeck, president of consultancy Communications Network Architects, Inc. in Washington, D.C. "These should be industry issues, not us vs. Cisco issues."

Paul Brown, a 3Com and Cisco customer who is director of network operations at Helix Health Systems, Inc. in Baltimore, said that the alliance is insignificant without Cisco's participation. "All of my key vendors need to have a role in this, so if they are not inviting Cisco, then it has no meaning to me," he said.

Those concerns were echoed by Cisco user Donald Varey, senior network specialist at Great-West Life & Annuity Co. in Englewood, Colo.

"That's pretty bad," he said. "Cisco's probably got a leg up on all of them with VLANs anyway, so they're just trying to combat that in some fashion. They're not going to be effective at it."

But they will try. The companies promised to work toward making their respective switching technologies, namely IBM's Switched Virtual Networking, 3Com's Transcend and Bay's Baysis, all work together in large network environments.

The Alliance members also said they will endorse the ATM Forum's Integrated Private Network Node Interface (I-PNNI) specification as the core technology for building ATM nets. Until now, Bay had largely been carrying the I-PNNI flag by itself. Despite these plans, analyst said the alliance appears to be longer on posturing than on specific plans for new products or standards.

IBM, 3COM AND BAY HOPE TO:

- ▶ **Simplify** the building of multivendor router and switch networks
- ▶ **Build** interoperability test beds
- ▶ **Develop** new standards for multivendor interoperability

They also said it is somewhat redundant, since its members already say their internetworking product lines are based on open standards.

Alliance members said during a conference call to analysts last week that other vendors are not being recruited to join the alliance, although interested parties would not necessarily be excluded.

Cisco executives said the alliance is flawed given that Cisco, Cabletron Systems, Inc. and others were not invited to join.

"This alliance sends the wrong message to users because they are saying, 'Play with us or don't play at all,' " said Nick Francis, director of marketing for the InterWorks Business Unit at Cisco.

"The best way to establish standards is through existing groups such as the IETF [Internet Engineering Task Force] and ATM Forum," he added.

"These guys are building a three-legged stool with one leg missing. Without the support of other big players such as Cisco, the effort is meaningless," said Anura Guruge, an independent analyst based in New Ipswich, N.H.

But perhaps Cisco's rivals feel that they don't have a choice.

"Maybe together they're going to be stronger against Cisco than they are separately," said analyst John McConnell, president of McConnell Consulting, Inc. in Boulder, Colo.

Senior Writer Jodi Cohen and Senior Editor Jim Duffy contributed to this story.

A B E N D

abend *(n)* **1:** abnormal end to a computer process **2:** the online fountain of 'Net wit and high-tech humor found on Network World Fusion (www.nwfusion.com).

Ten Internet flames that never caught on

1. A pox on your motherboard.
2. My Webmaster can out-code your webmaster.
3. Have you lost all sense of decency, sir? At long last, have you lost all sense of decency?
4. I don't want to say you have a small modem.Let's just say you're bandwidth-challenged.
5. Cybernaut, heal thyself!
6. You are as floppy as a floppy disk.
7. Anyone who surfs from (insert ISP here) is a sissy.
8. That was so funny I forgot to type in a smiley face.
9. RAM this!
10. Why don't you go back to AOL where you belong... Wait a minute, *I'm* from AOL.

by Chris Nerney

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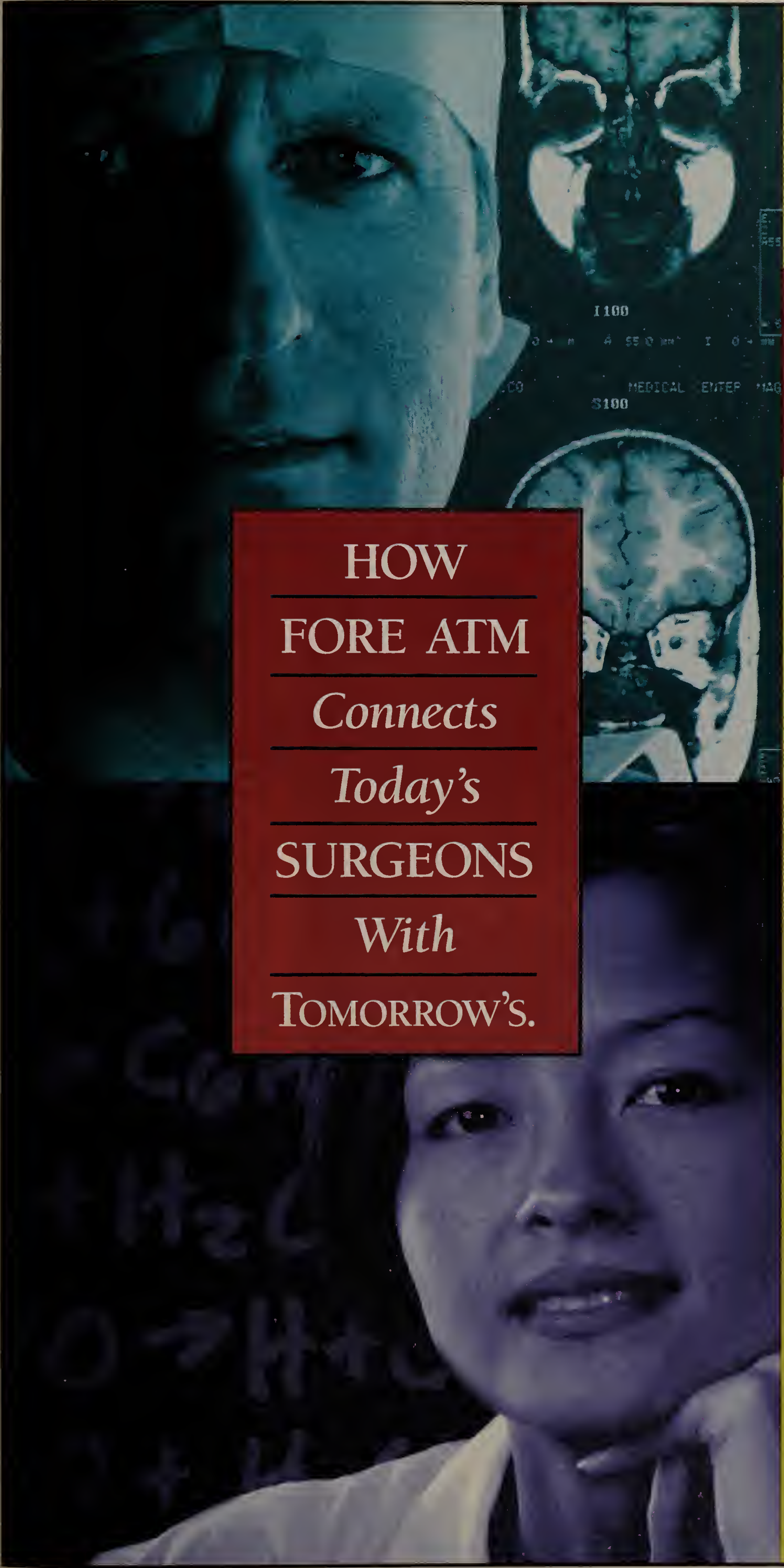

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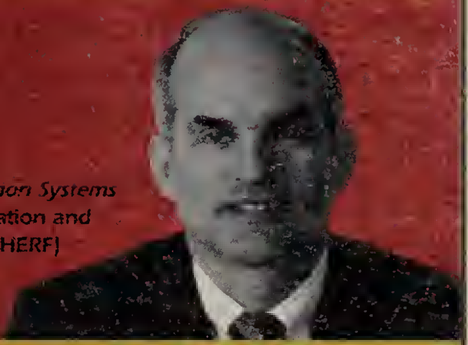

Wes Hutchison
Vice President, Information Systems
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Circle Reader Service **#33**

Fore

Continued from page 1

attention at the desktop now, but LAN switching is just an interim move," said Eric Cooper, Fore's chief executive officer, in a recent interview. "ATM will come down to the desktop because users will eventually find that it is less expensive to implement ATM across an entire network."

Fore's new ForeRunner products include a stand-alone ATM switch that supports as many as 24 25M bit/sec ports, as well as a six-port ATM25 switch module that fits into any of Fore's ATM switches, including the ASX-200WG workgroup switch.

Fore will also offer a new family of PCI adapters including 25M and 155M bit/sec cards, said a source close to Fore.

The products, which will be available this month, are expected to be priced at about $600 per desktop connection.

While many vendors, including IBM, Madge Networks, Inc., Optical Data Systems, Inc. and Whitetree Network Technologies, Inc., have already announced ATM25 products, analysts said Fore's commitment to 25M bit/sec ATM is the most significant.

"If the ATM leader comes out with an ATM25 announcement, then that gives a hell of a lot more credibility to that market," said Skip MacAskill, senior research analyst at Gartner Group, Inc., a consultancy based in Stamford, Conn.

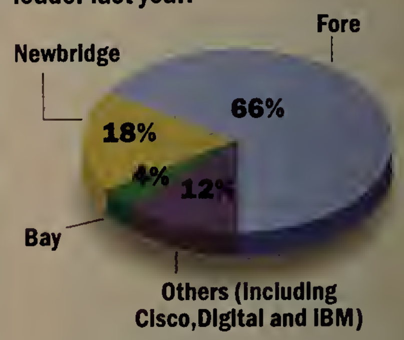
Competitor Madge Networks welcomed Fore into the ATM25 arena. "Fore getting into this business certainly validates our strategy of ATM25 at the desktop," said Ken Woods, director of ATM business management at Madge.

Fore's delayed entrance into the market was a sign that the company may not be completely sold on the merits of ATM25, industry observers said. But Fore's need to offer customers a complete ATM LAN product line outweighed any concerns about the technology.

One Fore customer said he likes Fore's one-stop shopping approach. "Fore is finally starting to realize that there's more out there than just backbone switching," said Mark Culotta, senior engineer at Advantis in Chicago. "Because the ATM Forum is dragging its feet on a lot of issues like IP, Fore realizes that customers are going to want a single-vendor solution to ensure interoperability."

Way out in front on ATM

Fore was the ATM LAN switch market leader last year.



Based on 45,000 switch ports shipped through November 1995.

SOURCE: MIER COMMUNICATIONS, PRINCETON JUNCTION, N.J.

Fore also needed to offer 25M bit/sec ATM gear to attract big accounts, an analyst said. "The largest ATM RFPs on the street today include ATM25, so if you don't have it, you don't play in those deals," said Thomas Nolle, president of CIMI Corp., a consultancy in Voorhees, N.J. "And many of those deals are, in the long run, worth 40,000 to 80,000 desks. You don't want to miss that."

While Fore said it has seen an increased demand in its user base for ATM25 products, analysts said the surge should be taken with a grain of salt, given that Fore's customers are more likely to want ATM25 than the typical customer.

"If you are running an adult video store and you are getting a huge influx of customers for a certain video, then you figure lots of people want it," MacAskill said. "But everybody who goes to that store would obviously be interested in that sort of product. You're not going to find the same type of demand at Blockbuster."

In fact, Nolle said, the majority of users will stay with Ethernet at the desktop because they don't need ATM25. "Even 15 or 20 years from now, there will still be more 10Base-T desks than ATM desks," he said.

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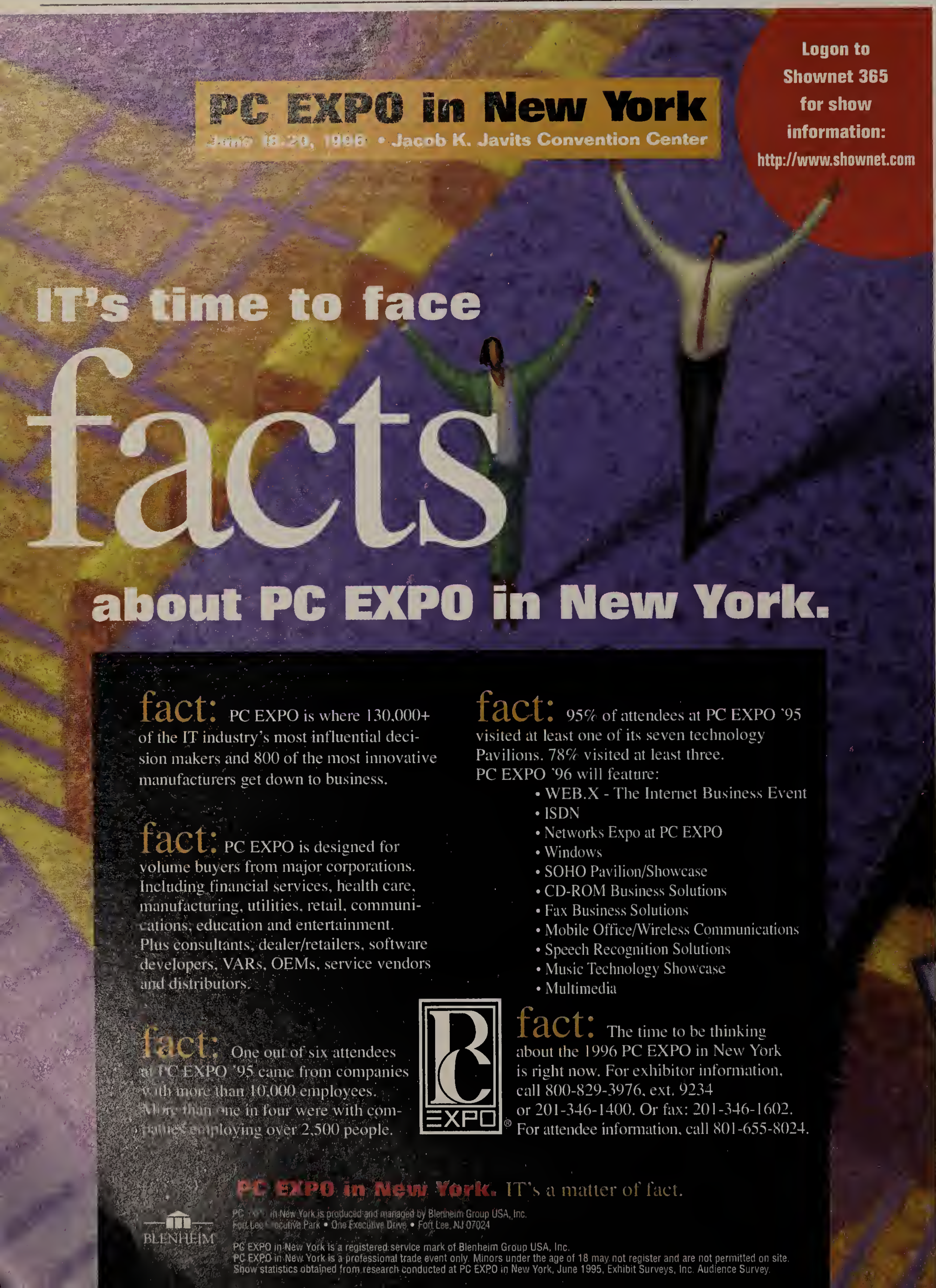
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Psychics at the PANIC hot line give advice on ATM switches, careers

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So, never one to pass up a good scam, er, thing, we've launched the Gibbs Psychic Answers Network Intelligence Center (PANIC). Our service is already generating millions of dollars for us every second of every day. When you call us on our 900 number, you'll hear:

Mark Gibbs

"Hi, don't panic, this is PANIC, your source for seeing the future of networking. Don't bother to tell us who you are, we already know (nah, we're not even trying yet, it's just that the automatic number identification thing works great). Now your mental condition is important to us, so please select from the following menu:

If you are obsessive-compulsive, please press 1 repeatedly. If you are co-dependent, please ask someone else to press 2. If you have multiple personalities, please press 3, 4, 5 and 6. If you are paranoid-delusional, we know who you are and what you want. Just stay on the line until we can trace the call. If you are schizophrenic, listen carefully and a little voice will tell you which number to press. If you are manic-depressive, it doesn't matter which number you press — no one will answer." (OK, so I stole that one from the Internet.)

After a half an hour of this recording (which will probably sound familiar to many of you 'Net aficionados), you'll be connected to a PANIC Psychic Support Technician. And to show you the value of our services, we'd like to share with you some of our psychics' recent consultations:

Client W: Which ATM switch should I choose? Psychic: Who cares? They're all the same. Client W: Are you sure? I mean, they all make such a fuss about their product's superiority. Psychic: Hey, that's nothing — you should talk to the Ethernet hub guys. That'll be $25, please.

Client X: What do you see in store for my career in IT? Psychic: What's your current job function? Client X: Tech support for an end-user organization. Psychic: Death from exhaustion before you're 30. That'll be 50 bucks. Next.

Client Y: What do you see in store for Microsoft with regard to the Internet? Psychic: They'll own a huge chunk of everything on the 'Net within two years. Client Y: I will? Gee, that's great! I mean — how interesting — Mr. Gates will be pleased. Thanks. Psychic: No problem, that'll be $6 billion, please.

Client Z: As president and CEO of Banyan, what should I do? Psychic: Retire. Client Z: I've never been so insulted. Psychic: You should get out more often. $20,000, please. Next.

As you can see, we offer real value for money.

You can consult the finest psychics recruited from our favorite bar, and we offer a money-back guarantee.

If you aren't 100% satisfied, your money will be refunded (less service fees, processing fees, authentication fees, my grocery bill, psychic stress fees and filing fees).

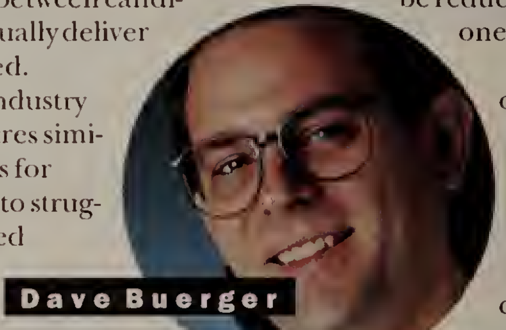
Yep, this is goin' to be a biggie. I just wonder exactly how big.

What's your star sign? I'm a Sagittarius, and I'd like to contribute to world peace. E-mail Gibbs at mgibbs@gibbs.com or call him at (800) 622-1108, Ext. 504.

Boring? Yes. But fiber to the desk is ready for action

Senator Bob Dole is throwing down the gauntlet. He is finally quitting his day job to focus on running for President. Dole's challenge is to stop sounding as bored with his cloudy message as voters are with the whole campaign.

While most everyone acknowledges the importance of government, most elections create big yawns. It's hard to see much difference between candidates, and they usually deliver less than advertised.



Dave Buerger

The network industry periodically endures similar dull campaigns for change. You have to struggle to get interested enough to make an educated decision, but even then, you are simply left hoping your choice will live up to the expectations.

One heretofore boring campaign has been the tussle of Category 5 copper wire vs. fiber-optic cable to the desktop. I admit the topic of cable excites me as much as Sen. Dole's stance on Senate parliamentary procedures. Besides, many of you would doubtless say: "What's to debate? Everyone uses copper because it's cheaper."

> *Copper's benefits end about 90 meters from the wiring closet.*

This discussion usually runs along these lines:

Fiber: Well, fiber has virtually unlimited bandwidth. Install it once, and your network is good for life.

Copper: So what? Category 5 handles 155M bit/sec ATM. Most PCs can't process a fraction of that!

Fiber: OK, but what about fiber's freedom from electromagnetic and radio frequency interference, and crosstalk?

Copper: Who cares? LANs are rarely disrupted by that stuff.

By this time, copper has just about wrestled fiber's arm to the table. But don't fall asleep yet. Fiber has a new angle that is likely to change the way large organizations wire LANs.

The magic word is distance.

Copper's benefits end about 90 meters from the wiring closet. In large organizations, this requires a myriad of power and air-conditioned closets for LAN switching and transmission gear. Fiber's 300-meter capability enables organizations to eliminate all wiring closets and centralize hubs, routers and switches in one location. This has big cos implications.

Centralizing wiring by running fiber to each desk simplifies physical network management, such as adds, moves and changes. The number of technicians can be reduced because everything is in one room.

Centralization cuts the oversupply of extra ports in distributed closets, which reduces the cost of electronics.

Centralization also allows the cost-effective creation of special workgroups that require advanced technology, such as ATM. This is cost-prohibitive in a distributed wiring environment.

A big proponent of this scheme is AMP, Inc. which published its strategy last week (www.amp.com/networking). AMP, which sells copper and fiber wiring solutions, claims the per-drop cost of fiber wiring systems is within 10% of copper.

AMP also says that centralized wiring with fiber to the desk saves money. It pegs the annual per-user cost of operating a LAN with distributed wiring at $550. Centralized wiring with fiber cuts that 32% to $375. These savings recur each year.

If you doubt these numbers, AMP has a proposition: It will install fiber to your desktops, manage the LAN for the equivalent cost of managing a copper network and pocket the difference. The management service is called NetGain.

And in case you're wondering how to do centralized wiring with fiber, in March the Telecommunications Industry Association released document TSB-72, "Centralized Optical Fiber Cabling Guidelines" (800-854-7179). This document is the Bible for network designers, detailing system components and procedures for wiring commercial buildings with fiber to the desk.

Fiber-optic wiring to the desktop may be a dull topic, but this is the first time its financial benefits have crystallized into something more real than a vote-baiting promise.

Buerger is a networking industry consultant and writer in Atlanta. He can be reached at dave@buerger.com.

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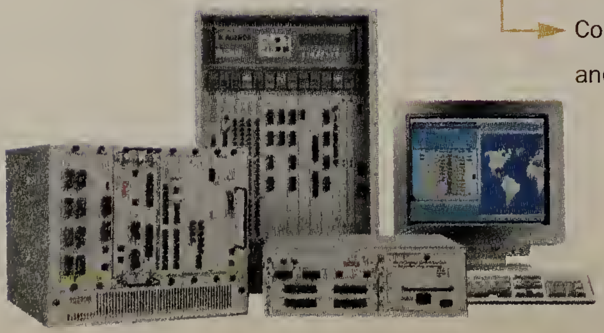

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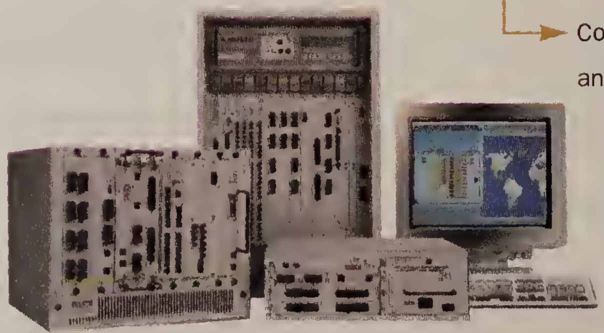

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Based on these statistics, the most pressing information problem you have today is – *getting corporate information to the people who really need it.* Every company recognizes how important information is to its workers, and NETWORK WORLD UNPLUGGED provides you with the knowledge and capability to get these workers, the small remote office worker and the "Road Warrior," connected better, easier and more cost effectively.

Each of the Conference tracks takes you from benefit assessment, through alternative approaches, to implementation and includes real-world, focused solutions on the issues which are most helpful to you in your business and your network, today and in the future. The four pivotal tracks are –

1. **Extending the Enterprise: Bringing Corporate Networks to New Locations.** This track focuses on empowering remote branch offices and small office, home office (SOHO) workers.
2. **Working on the Web: Internet & Intranet Strategies.** If you want to get the most out of the Internet in supporting remote sites and mobile workers, or build your own Internet- like corporate information network, this track's for you!
3. **Mobile Solutions: Supporting the Unplugged Worker**, deals with the REALLY unplugged, the mobile worker who must rely on public dial facilities or even wireless technology.
4. **Issues and Answers: The Latest Technologies.** A variety of fast-paced head-to-head debates between industry experts and vendors on what's best in remote access and futuristic technology presentations that will take you over the edge.

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- Looking for a new approach to building corporate information distribution applications? Sun Microsystems' Java language lets your software run on PCs, UNIX workstations, and Macs. Applications can be stored on your servers and downloaded as needed.
- Is your remote access opening a door to your private resources that anyone can walk through? Security and firewalls are a critical part of remote access, but one that is all too often ignored.
- Are Internet tools like HTML and Web browsers an effective way of distributing information? We'll talk about the policy issues and the tools you can use.
- How are you going to manage all of this? Networks that can't be supported can't be used. We'll talk about management systems and policy issues to help you get the most out of the technology and services you buy.

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